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ELEMENTS  
OF THE  
MATERIA MEDICA,  
AND  
THERAPEUTICS.

BY  
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PART I.

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## PREFACE.

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THE following Elementary Treatise has been prepared for the use of the class in attendance upon the Lectures, in the Medical College of the State of South-Carolina. Such a work would seem superfluous at the present time, abounding in Treatises upon almost every subject, and it would not have been undertaken, but from the author's connection with the College. In this relation, it furnishes the lecturer with a work to which he can refer his pupils, as a companion and assistant, during the period of their studies. The succession of Lectures with which the student is daily occupied, renders it proper that the course of studies be facilitated by every practicable method. In no department are such facilities more required, than in the *Materia Medica*—which being addressed more particularly to the memory, requires all the aid which can be brought to its support. In addition, he hopes, that in his arrangement of his subject, and the articles, in the exposition given of the operations of Medicines, and the Therapeutics proper, he has been able to add much to the information usually found in the Treatises adopted in the several schools.

The Introductory Lectures, comprise in a great degree, matter not to be found in any of them, in his view so important, that it has always been a subject of surprise, that they should have been overlooked.

In preparing this part of his labours, he must confess obligations to many in this country, and abroad, and more particularly to the writers of the French School. To enumerate them all would be a difficult task, since, the work put forth, is the result of reading and

observation for many years, and the thoughts of others have become so incorporated with his own, that a separation is not now attainable.

To Barbier's *Elements of the Materia Medica*, he is more indebted than to any other work, having drawn upon it with freedom in the Introductory Lecture, and availed himself of his description of the physiological phenomena following the use of Emetics and Cathartics. The references at the conclusion of each subject, will exhibit his indebtedness more particularly. To the *Dictionnaire de Medicine*, *Dictionnaire des Drogues*, *Dictionnaire de Matiere Medicale*, *Rees' Cyclopædia*, he has been indebted for useful information.

To the Medical Commentaries upon the article Camphor, to the *Edinburg Physical and Literary Essays*, and to other periodicals in Europe and this country.

*January 13, 1843.*

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# INTRODUCTORY LECTURE.

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## GENERAL VIEW OF THE MATERIA MEDICA.

BEFORE entering upon the particular consideration of the department which it is my province to teach, I shall devote a few Lectures to the consideration of certain general subjects, to which allusion will frequently be made in the progress of the course.—These will be brought to your view in their proper order.

In the present lecture I shall take a general view of the *Materia Medica*; point out its connexion with other studies; the subjects it embraces; and offer such remarks as suggest themselves in reference to the object proposed. The *Materia Medica*, to which also the term *Pharmacologia* has of late been applied, (from *Pharmakon*, Medicine, and *Logos*, Discourse,) is that part of the study of medicine which treats of the various remedies in use. It comprehends a knowledge of the intimate composition of these agents, the physiological effects which follow their employment upon the system, and the practical benefits which are derived from their operation. To obtain all these objects in the highest degree, it is proper that we should be acquainted with the Physical and Chemical qualities of the substances which constitute a medicine, and to know the changes and the alterations which these substances experience before they can be rendered useful. The study of these several subjects extends the boundaries of our science, and brings under its domain a number of others, which become necessary for its full and thorough acquaintance.

Natural History is tributary to it, when it searches into the productions of the Three Kingdoms of Nature, for the substances which are endowed with medicinal qualities. Pharmacy, which is occupied in converting these substances into medicines, in giving them a form which favors the exercise of their properties, is also a branch of this science. The *Materia Medica* is associated with Chemistry, when it penetrates into the texture of medicinal articles, when it separates the immediate principles which constitutes them, when it enumerates the number of these principles, and when it determines the proportion of each in these compound bodies.



On the other hand, in tracing the action of medicines upon the body, the nature of the impression which is made upon the several organs, and the effects which follow their employment, it is necessary that we should recur to Physiology, which teaches the action of these organs. With the Practice of Medicine there must exist a very considerable and close alliance: for we can speak of an article without regarding the diseases to which it is applicable, without having reference to the assistance which it furnishes in opposing the progress of sickness, and of viewing it as an agent proper to remove, in many instances, the morbid actions which exist?

With this very general view of the connexions of the *Materia Medica*, I shall take up the consideration of the natural substances employed in medicine.—These, as you already know, are extremely numerous. Man, under the influence of pain, seeks relief in every thing which surrounds him. Having exhausted all the accustomed sources of relief, he addresses himself to others. Any success encourages his boldness, and substances the most dangerous, and most contrary to his organization, are transformed into medicinal means. Deprived of any fixed principles in directing his researches after substances proper to become medicines, he adopts at first without scruple, and without examination, every production which appears likely to be useful. Thus it is, that a multitude of remedies of doubtful properties are accumulated together; and whatever the Animal, Mineral, or Vegetable kingdoms could furnish, have been made a part of the *Materia Medica*. The number of these articles I shall much curtail, and will endeavor to present to you such only as are of tried and acknowledged powers—such as are capable of making upon the living structure an impression which modifies its actual state.

The substances which constitute the *Materia Medica*, are derived from one or other of the Three Kingdoms of Nature—from Vegetables, Minerals, or Animals.

From the Mineral kingdom we obtain but few articles in comparison with the Vegetable; but this deficiency is supplied by their very great activity. “In their pure or metallic state they exert but little action upon the system, and any effect they do produce, appears to arise from their being chemically acted on by the gastric juice. When oxidated they become more active; and still more so when the oxide is combined with an acid. The degree of oxygenation considerably influences their powers: so that from the same metal preparations of very different degrees of medicinal activity may be obtained, though all agreeing in the kind of action they exert.”—*Murray's Materia Medica*.

It is from the Vegetable kingdom that we are supplied with the greater number of articles employed in the *Materia Medica*.—

Being the products of organization, their composition is more simple, and resolvable into a few elements, while the mode in which they are formed is much more complicated. Thus the ultimate elements of Vegetable substances are few in number, consisting of Carbon, Oxygen, Hydrogen, and sometimes Nitrogen; and it is the various combination of these principles that gives rise to the great variety of vegetable products. Combinations of the same elements are formed therefore greatly diversified, and properties are derived from differences of proportions or modes of union.—Hence an infinite variety is observed in the productions of this kingdom, and as these productions are greatly extended, we are in possession of remedies different in powers, and adapted to every state of disease.

The active principles of plants being influenced by a variety of circumstances, particular attention should be paid to whatever relates to their growth or preservation. It is important when we wish to avail ourselves of their medicinal properties, that we should regard the period of their maturity, since to each period of their growth, there corresponds most commonly a chemical composition peculiar to that stage. The Roots, the Stems, the Leaves, the Flowers arrive successively to maturity, when each of these parts are possessed of properties rendering them capable of being made efficacious medicines. Before the time of their perfection, these properties are not matured—beyond this they are exhausted.

The Intimate Constitution of Plants is influenced by the soil in which they grow, the degree of moisture or of heat to which they are exposed, as well as by the portion of light and air which they enjoy. These are the causes which affect the functions of the vegetable life, which regulate the operations upon which depend the developement of all parts of the plant. These causes decide the chemical composition which the different parts exhibit, and render deficient, or abundant, the medicinal principles from which the value of the article is derived.

I shall embrace the present opportunity to make a few remarks upon the general economy of plants, with directions upon the period of gathering and preserving them. I am the more particular, as you will find but little said upon this subject in any of the systems to which you can have reference.

Plants are to be gathered from places and soils where they grow spontaneously in a dry season,—when they are neither wet with showers nor dew,—they are to be collected annually, and those which have been kept longer should be thrown away.

The gathering of roots should always be made when the leaves and stalks are dead. There are two seasons when this may be done, the Spring and Autumn. Authors are not agreed which of the above periods should be preferred in making a collection—



some recommending one season, and others another. The best period is the Autumn, after the sap has descended into the roots. At this season the active principles not being engaged in giving nourishment to the plants, are collected in the roots, and may be said to be in a concentrated state, while in the Spring they are diluted by the quantity of aqueous fluid which the root appropriates to itself, and which in short renders its substance soft, pulpy, and almost without activity. Experience has shown that the roots of this season are reduced in drying one half more than in the fall, especially those which are large and fleshy. They are also liable to undergo a degree of fermentation from the quantity of moisture they contain. The Autumn, therefore, should be preferred.

*Barks* ought to be collected at that season when they can most easily be separated from the wood. The general rule is to collect in the fall, the bark of those trees which are not resinous, and in the spring those which are.

*Leaves* should be chosen when they are most vigorous and in their best state. The plant is in that state when the flowers are about to unfold. It would seem that the design of the growth, and increase, of the rich foliage, and the gorgeous flower, with which Nature decorates the vegetable kingdom, has for its ultimate object the formation of the seeds, and the propagation of the plant. The display which we so frequently witness terminates in this act—the fecundation of the seeds—since when accomplished the plant fades, withers, and dies. The leaves, therefore, and every part of the plant, are in the highest state of perfection when the flower is about unfolding, and at this period they should be gathered.

*Flowers* are to be plucked when lately unfolded.

*Seeds* are to be collected when just ripe, and before they begin to fall from the plant. They ought to be preserved in their proper seed vessels.

In the Preservation of Plants it is proper to pay particular attention to the drying of them. It is essential that their desiccation be conducted in such a manner, that the substances so submitted may not sustain any alteration in their nature, and that the principles to which are attached their medicinal virtues may be preserved. For this purpose they should, soon after they are gathered, be thinly spread out, and dried as quickly as possible, and with a heat so mild that their colour be not changed—then preserved in places or proper vessels, excluded from the access of light and moisture.

The following is the method practised in their preservation.—Plants to be preserved are collected during a dry season, and after the dew has been dissipated. All foreign substances should be



separated from them, they should be stript of the dead or faded leaves, placed upon a hurdle or table, and exposed to the heat of the sun, or upon a stove, or in a bakehouse. The leaves are turned several times a day in order to renew their surfaces, and they are left exposed until they become perfectly dry—that is until they are readily broken in the hand. They are then removed and kept in a dry place for several hours. The leaves attract moisture so as to lose much of their brittleness. They are then preserved in proper places excluded from the light and moisture. The best method of preserving the virtues of Plants is that practised by the Friends of New Lebanon, in the State of New-York. After the leaves are thoroughly dried in the manner I have mentioned, they are placed into moulds and firmly compressed. I show you a specimen of the manner in which it is done. By this method they are preserved from the changes of the weather—from moisture—light—and whatever tends to injure the properties of the plant.

**Preservation of Roots.** They should be gathered as I have mentioned in the fall season. They should be washed in water to get rid of the dirt, and some of the mucous substance that would otherwise render them mouldy. The larger roots are cut into pieces—split or peeled—but in most aromatic roots as those of the Umbelliferous plants, the odor residing in the bark, they must not be peeled. The pieces are spread on sieves or hurdles, and dried in a heat of about 120° Fahrenheit, either on the top of an oven, in a stove, or steam closet, taking care to shake them occasionally to change the surfaces exposed to the air. Thick and juicy roots, as those of Jalap, Rhubarb, Briony, are cut into slices, strung upon thread, and hung in garlands. Others, as Squills, are scaled, threaded, and dried in chaplets round the tube of a German stove, or in a hot closet.

It will be proper to consider the means by which the Medicinal Properties of Plants may be discovered.

The Sensible qualities of Plants, such as *Colour, Taste and Smell*, have an intimate relation with their properties, and may often lead by analogy to an indication of their powers. Certain it is, that many substances which are insipid, and inodorous, rarely possess any virtue; and a number of such articles have been discarded from practice. It is true, that observations derived from this source will not serve us in forming very minute distinctions, but they will be found almost always adequate in vegetable productions to enable us to distinguish what is innocent and salubrious, from what is noxious and virulent. That a foundation exists for this distinction, we would infer from the conduct of the brute creation, who in their selections of food seem to be directed by the sensible properties of the plants presented to them, and it is rarely that any bad effects follow their reliance upon this guide. That

to a certain extent we can be determined in the choice of substances by these characters, we know from the practice of mankind, who in the examination of an unknown substance instinctively apply to the senses for information respecting its properties. In respect to *Taste* it may be observed that what is sweet, agreeable, or aromatic, proves nutritive and salutary, while on the other hand vegetable poisons are nauseous, acrid, and disgusting. Bitterness, when not extreme, denotes a tonic quality, which will stimulate the stomach and intestines, and promote the process of digestion. Astringency is indicated by a styptic taste: aromatics are stimulating, &c. Taste cannot be relied upon, for we know that both Quinia and Strychnia have a bitter taste, yet they differ widely in their effects—one being tonic, the other poisonous.

As relates to *Smelling*, it may be observed, that strong odours are narcotic and often poisonous—Nature thus seemingly protecting the more rational part of creation from the pernicious consequences which would arise from their use. Notwithstanding what has been said upon the subject of these two senses, there are so many causes of obscurity and error in these indications, that they do not admit of very extensive or accurate applications. For such is the diversity of tastes, and so difficult is it to reduce them to any precise definitions or descriptions, that but few general rules can be formed from them.

Another means of judging of the medicinal qualities of plants, is by paying attention to the Botanical affinities. By these affinities is meant, that plants agreeing in their general structure, habit and appearance, have also a similarity in their effects upon the system. The greater number of authors appear to believe, that plants which resemble each other in their external form, also resemble each other in their properties: but no one has asserted the above fact in such strong terms as Linnæus in his Dissertation upon the properties of plants, in which he not only asserts that plants of the same general characters have the same properties, but that the same natural orders have properties allied to each other, and that even those of the same class approach each other in their effects. Jussieu has adopted the same opinion. Not only authority, but analogy, confirms the above belief. Thus all the Grasses have their seeds of a nutritive and farinaceous character.\* The Labiated plants are stomachic and cordial---as Sage, Rosemary, Hyssop, Hoarhound, Lavender, Mint. The Umbelliferous have seeds tonic and stimulating—as Angelica, Fennel, Coriander, Assafoetida, Ammoniacum. Those of the Euphorbiaceous are acrid and purgative—as Castor Oil plant, Croton Oil plant, Euphorbia

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\**Lolium Temulentum* a plant growing in England, an exception, said to be deleterious—*Festuca Quadridenta*, a Peruvian grass, described by Humboldt, very poisonous and even fatal to animals, another exception.



Ipecacuanha, and Euphorbia Corollata. The juice of the Coniferae, trees bearing cones—as the Pines, Larch, &c., are resinous. The bark of the Amentaceæ\* is astringent and febrifuge, as the Oaks, Hazels, &c. This mode of judging plants would seem to lead to pretty correct conclusions respecting their properties, and experience does in many cases prove that such analogies are well founded. For it would be reasonable to suppose, that a certain structure of the leaves, of the parts of fructification, and of the general economy of the plant would lead to a similarity in their secretions and properties. This general structure is, in short, what might be called the physiognomy of plants, and by observing which we are capable in many instances of determining their qualities. When, therefore, a new species of any genus is discovered, the discoverer may infer that it possesses virtues similar to those of the genus to which it belongs. I might illustrate the preceding remarks by examples from other of the natural families, but in a study so little known as Botany to the generality of students, further details might be tiresome. I shall be satisfied with having called your attention to the subject and illustrated it by a few examples. It must however be observed, that the remarks upon this subject must not be taken in an unqualified sense; exceptions do occur, and in some particular instances, this close alliance in structure and habit is attended by very great differences in effects. As familiar examples, I may mention the Solanum Nigrum or Deadly Nightshade, and the Solanum Tuberosum or Irish Potato—the Cucumis Melo, or Musk Melon, and the Cucumis Colocynthis or Bitter Cucumber. These very great distinctions may be in some measure attributed to cultivation, which changes the habits and properties of the vegetable as much as it does of animal life. To take a few examples—who would suppose that the Sour Sloe had by cultivation been ripened into the pleasant Plumb, or the austere Crab Apple of the woods into the Golden Pippin? That the common Colewort by culture, continued through many ages, appears under the improved and more useful form of Cabbage, Savoy and Cauliflower? Though cultivation has had such influence upon the Solanum Tuberosum as to render it one of the most useful vegetables which is planted, yet it has not destroyed altogether the characters by which it is classified, nor separated it from its kindred article, the Solanum Nigrum, since it has been lately shown that an extract prepared from the leaves and flowers possesses valuable properties as an *anodyne* remedy. The subject has of late excited much attention, and it is admitted that with some exceptions, the botani-

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\* Amentaceæ, so called from the flowers of the trees hanging down in the form of a rope.



cal affinities will afford very important aid in determining the properties of plants. A knowledge of them with the information which is to be derived from the sensible qualities, will give to the Physician great advantages in his researches, and enable him very frequently, without an acquaintance with a plant, to judge of its general properties. It would be desirable that such of you as have opportunities of cultivating Botany should make yourselves acquainted with this interesting study, at least with its general principles. Certain it is, that an acquaintance with its principles will give to the physician, in forming his opinions, the same advantages which the educated practitioner possesses, over the mere pretender in medicine.

The several means enumerated, of judging of the medicinal properties of a plant, will however be insufficient of themselves—they must be subjected to the test of experiment. This is unquestionably the most conclusive method which can be pursued, and to which all the preceding are subsidiary. When any article has been experimented with, and certain results follow its administration, they may be considered as the effects which will follow its use. When these results take place with tolerable uniformity, they constitute what has been called experience. This is undoubtedly the highest evidence we can desire, and the surest guide when the observations are sufficiently correct, and the circumstances discriminated in so clear a manner as not to create any confusion. Where these requisites are not attended to, the conclusions drawn may be very fallacious, and hence such a discrepancy in medical opinions often prevails.

It may not be amiss to state some of the circumstances which in our experiments often lead to false conclusions, and which should be guarded against. There are a variety of circumstances which, abstracting from any suspicion of bad faith in those on whose testimony the credibility of facts depends, have a tendency to vitiate the accounts of what is commonly dignified by the title of experience. Such is the case where the experimenter has some previous opinion to support, when it always happens, that the results are considered through the medium of his preconceived views. This is so obviously the case, that it only need be mentioned in order to show how irreconcilable such a state of mind will be, with a candid statement of facts. Another circumstance calculated to weaken the evidence from experience is, that admitting there are no preconceived opinions, and a jealous exclusion of all theoretical views, still there will always be a great deal of doubt and conjecture in whatever appertains to the operations of the living system, at least when compared with what is required in Chemistry or in Mechanics. From this cause it happens, that the operations of nature are often mistaken for those of our reme-

dies, and many properties attributed to them which they do not possess. Thus it is that Seneka Snake Root acquired a reputation for curing the bite of the rattle snake—that burnt Sponge was a remedy for consumption, and in our day that Iodine was calculated to remove the equally distressing disease, scrofula.

The case of Mrs. Stephens may also be cited as coming under this head.—She received a large grant from Parliament for the discovery of certain medicines for the cure of the Stone. A committee of professional men were appointed to ascertain its efficacy, and a patient with Stone was selected for the purpose of trying the remedy. The patients' suffering was relieved upon taking the medicine, and upon examining the bladder some time after, no Stone could be felt. It was therefore agreed that the patient had been cured and the Stone dissolved. Some time afterwards this patient died, and on being opened a large stone was found in a pouch formed by a part of the bladder, and which communicated with it.—*Paris.*

Admitting however, that the difficulties I have mentioned in the way of acquiring correct experience were less founded. Another obstacle would arise in the fact, that the description of any medical case, can seldom or ever include all the circumstances with which the result was connected, so that though certain effects followed the use of any particular article, we can not say what were the particular conditions of the system, what concurring circumstances tended to produce such an effect, or how the system was favorably disposed to the action of the agent employed.—Therefore, though the facts described to be true, yet when the conclusions to which they lead come to be applied as a general rule in practice, it is often a rule transferred from a case imperfectly known, to another of which we are equally ignorant. From this cause it happens that such frequent complaints are made of the uncertainty of medicine, and that disappointment so frequently attends the operation of our remedial agents. The fault probably does not depend upon the substance employed, but to the want of discernment, or what has significantly been called tact in the physician. With the truth of the remarks I have made, in the difficulties of acquiring correct experience, there are few physicians who have been engaged in practice, who will not acquiesce. Do not understand me as wishing to undervalue the utility of this highest of all evidence, but as suggesting caution in receiving all that is referred to this head, and in forming your opinions.

The last method of acquiring a knowledge of the virtues of plants usually resorted to, is Chemical Analysis. There can be no doubt that from this mode of investigation, much useful knowledge may be acquired, and considerable insight afforded into the medicinal properties of plants. With the discovery of certain

principles we are led to the virtues and the applications of the article under examination. Thus with the discovery of Tannin and Gallic acid, astringency is known to exist, and with Resins a cathartic property. Gums, Mucus, and Fæcula are emollient, demulcent and nutritious. Fixed Oils are laxative, and the volatile are aromatic. Bitter extractive is usually tonic, and the acids are refrigerant and antiseptic, &c. But though Chemistry unfolds to us the particular principles which predominate in a plant, and to which it owes its efficacy; yet it can never take the place of experience, since while it points out the number, it has not been carried to that degree of perfection as to determine their exact combination, the state of chemical union, and those nice proportions of different ingredients upon which the distinctions between vegetable substances so frequently depend.

Carbonic Acid, and Oxalic, are composed of the same ingredients, but in different proportions, yet affect the stomach in an opposite manner. Quinia, Morphia, and Strychnia, present but slight differences in their composition, yet their operation is very dissimilar.

	<i>Quinia.</i>		<i>Morphia.</i>		<i>Strychnia.</i>	
Carbon, . . . .	75	76	72	20	77	21
Hydrogen, . .	7	52	6	24	6	73
Nitrogen, . . .	8	11	4	92	5	96
Oxygen, . . . .	8	61	16	66	10	10

The analysis of vegetables has of late been carried to a very great extent. It has in several instances been able to seize upon and separate the active principles of a plant from all other ingredients, and thereby prove to us that in the substances upon which the experiments have been made, the active property is a distinct and essential principle. Whether the number of these articles will become extended, and in each the differences of their action will be found to depend upon a distinct substance, or on the combination of the vegetable principles already known, time only will determine. In the mean time we cannot but acknowledge the very important assistance the *Materia Medica* is daily deriving from that science, and its utility in pointing out the medicinal properties of plants.

From the Animal kingdom we derive but few medicines, and such as have been employed are so nauseous, and frequently so inert, that they have been discontinued in practice, or nearly so. There are, however, one or two articles of great power still in use.

The substances, then, or medicines which are comprehended under the title of the *Materia Medica*, are derived from the three Kingdoms of Nature. It is rarely or never that they are simple substances, but they are composed of principles which are differ-



ent in their nature, and more or less numerous. This variety gives to each medicine properties which are peculiar, and which distinguish them from every other. If aqueous, gummy, oily principles, etc. prevail, they form medicinal agents, inert, insipid, and without much virtue, which are only useful as demulcents. If principles which are bitter, saline, resinous, enter into the composition of a medicine, it becomes possessed of powers much less equivocal—and these principles enter into the majority of those substances which are usually employed. In other cases there are found elements so energetic, as to give to the article in which they are discovered great activity, insomuch that they may become dangerous. These are medicines which contain the vegetable alkalies, as the Emetine, the Strychnine, the Morphine, the Brucine, etc., and which are to be given with great caution and in small doses.

It is easy from this view to conceive, that each medicine is endowed with an active power, which becomes sensible as soon as it is brought into contact with the living system. Can we develop the essence of this action, or penetrate into the conditions of its existence? Notwithstanding the difficulties of the subject, the curiosity of physicians has been excited to inquire into the cause of this inherent power of medicinal agents. They have made various efforts to raise the veil which obscures the subject, and have buried themselves in a number of researches to discover the sources of it, and to know the causes of it. So far we must confess that the means of investigation employed in the Physical and Chemical sciences have been useless, and the conjectures which have been formed as to the immediate cause of the active powers of medicines generally, have been vague and visionary. The effects which follow their action may be conceived to depend upon the impression made by their particles upon the organic structures, and that the sensible effects which are produced, may be considered, for the most part, as a reaction which the powers of the vital principle determines in these parts to resist their operation. In the application, therefore, of a medicinal agent to a living part, if it is capable of making an impression, there is an effort excited to resist its action, and from this there results a connected series of movements, which are manifestly the efforts of these organs to rid themselves of the medicinal substance. This leads to the *modus operandi* of medicines, which will form the subject of the next lecture.

Having said much upon the Relations of Botany to Medicine, I cannot conclude this Lecture without enforcing the study upon you from three-fold considerations.

1. Its utility in the stations you are to occupy as physicians. You are aware that the most valuable of our remedies are de-

rived from the Vegetable kingdom, and that these are influenced in their effects by circumstances connected with their growth, age, season at which they are gathered, etc. It is therefore highly important that we should be acquainted with the organization of the vegetable world—know the laws which regulate its increase, maturity and decline—the changes to which they are subjected at different stages of their growth. Without this knowledge we cannot be certain that the plant which we are employing is in a state to furnish all the benefits which may be afforded.

A knowledge of this science is further necessary to enable us properly to discriminate one plant from another. Common names are often so fancifully and arbitrarily applied, often too the same name, or a slight variety, designating plants totally different in their classification, properties, habits, that a degree of knowledge more than is commonly possessed, is required to distinguish one plant from another—to show the fallacies which have determined its title or its application—and to establish in one's mind a correct estimate of the value which should be attached to its reputed properties.

Furthermore, the common people in their discussions upon the names and properties of plants, are apt to appeal to physicians as umpires in their disputes. When the information sought after can be furnished, and that determined by a scientific acquaintance with the subject, the effect is uniformly favorable to the attainments of the physician, and proportionately raises his character.

In the second place, it furnishes the mind, particularly when the scene of our labors is the country, with a source of much and ever varying amusement. The faculties of the mind which are called into exercise in the pursuit of this study, are such as conduce to its improvement as well as to its gratification. With the exercise of memory in treasuring up the names and localities of plants, the powers of observation become enlarged, and the perceptions are also awakened. The mind passes with rapidity from one object to another—dwells upon its prominent beauties, or dives into a minute analysis of its structure—derives pleasure in the order, regularity, fitness of parts which are so conspicuous in all, even the most insignificant of Nature's works. An amusement so rational, while it purifies and elevates the feelings, fills up much of the vacant hours of life, which often, from no other cause than the absence of occupation or a pursuit, are spent in unprofitable amusements, sensual indulgences, or vicious and degrading excesses. Once a Botanist, his pleasures are not confined to his immediate climate—the productions of other countries invite and captivate him—wherever chance or inclination lead him he is at home—to him all nature smiles, and myriads of objects court his acquaintance, and seem formed for his pleasure.

Lastly, it affords to an improved mind, much and rich food for philosophical reflection.

"Take the phenomena of vegetation, and what a secret world of wonders is there in every plant! Growth, vegetable growth, which to the ignorant is a bare and naked fact, is to the scientific eye a history, a whole history of things the most interesting to every intelligent mind. Survey it throughout from its foundation silently and mysteriously wrought in the dark and senseless earth until it rises up to the stately plant or the towering forest tree---examine its intimate structure---trace the firm and tough fibres which give it strength to resist the storms amidst which it flourishes---observe the ducts and channels carefully laid in it to convey streams from the rich fountains of life below---mark its numerous cells, those secret laboratories of Nature---survey all this exquisite and wonderful workmanship, and who, I ask, would not know something of all this? Who would not give a little time to procure so great satisfaction? Who would be content to pass through one spring season, and understand nothing of these most curious and wonderful processes that are going on around him?"  
—*North American Review*.

REFERENCES.—*Traite Elementaire de Matiere Medicale*, par J. B. G. Barbier; *Paris' Pharmacologia*; *Seyder's Examinations*; *Cullen's Materia Medica*; *Pereira's Lectures*.



#### ON THE MODUS OPERANDI OF MEDICINES.

PREVIOUS to the consideration of the *Materia Medica*, properly so called, it may be expected, and it is usual to give some general idea of the modes of operation of those articles which I shall present to you. This is not a subject of mere speculation, but one upon which you will be expected to have such settled views as the obscurity in which it is involved will admit. I wish it was in my power to remove all the doubts and difficulties which overhang the subject; but as our path is checkered and beset with many difficulties, I will endeavor to be as good a guide on the way as I can, hoping that it may be the good fortune of some of you, to fall upon a nearer and less intricate route.

The *Modus Operandi* of Medicines is, as I have observed, an intricate and obscure subject, one upon which much speculative and ingenious reasoning has been exercised, and one to a physician teeming with interest. The only point fully admitted upon this subject, is, that the operations of medicines do not depend on the laws of matter and motion which take place in inanimate bodies, but on a principle which exists in living animals only.



"Medicamenta non agunt in cadaver." This principle we have denominated life, and upon which as controlling and modifying the actions of medicines, I shall make a few remarks. What *life* is, I cannot attempt to explain, but only the circumstances under which it is found. It is found intimately connected with organization, and the greater or less perfection of the organic arrangement gives rise to more or less perfect life. In the higher orders of animated bodies, we observe a variety of functions continually exercised, and from these numerous phenomena ensue. In them we observe a cavity of the skull which is filled with the brain—a spinal marrow—nerves of two sorts—five senses—muscles partly obedient to the will, partly independent in their action—a digestive canal—vessels and lymphatic glands—arteries and veins—a heart and lungs. From these various actions arise, and the term *life* is applied to an aggregate of phenomena which manifest themselves in succession for a limited time in organized bodies. These organs are but so many parts of a machine destined for the preservation and support of the animal; impair these, health is impaired, and the energies of life—for health and life, we conclude, are designed from the animal mechanism; destroy any of these organs of importance to the system, and health and life are destroyed.—The misfortune is, that life has been considered as a principle existing by itself, and independent of the actions by which it is manifested. It has been considered as distinct from the body, and as separable from it. Organization is however essential to life, and it can no more exist without it than gravitation without weight.

By one class of writers the phenomena of life have been ascribed to organic structure, just as the sounds of a musical instrument are referred to the mechanical arrangement of its parts.

By another class it has been assumed, that there exists a living internal principle, (some have compared it to the electrical,) distinct from the body, and which is the cause of the organization.—*Barclay on Life and Organization.*

Of the nature of this principle we can know nothing, and all attempts to explain it have terminated in absurdity. We can only judge of it by its effects. These we know are a capacity of resisting the combined action of *heat, moisture, and air*, to which the body yields when deprived of it. Here chemical operations commence which tend to its destruction, and it is these laws which are kept in subjection while vitality continues. The latter maintains our existence, while the former is our perpetual enemy, we may say. By a preponderance of the one, we are kept in health—by a preponderance of the other we become diseased, we die, and are decomposed. Between these laws, therefore, there is a constant struggle.

Another property inseparable from vitality, is the capacity of adding to the growth and increase of the system. The conversion of alimentary matter into a nutritive fluid, and its assimilation, experience no interruption while the animal is in health.

*Caloricity*, or the power of animated bodies to maintain a certain temperature in every variety of latitude, is another property peculiar to life. Such are the effects of this wonderful principle. We do not know of it in a separate and distinct state of existence, and only become acquainted with it in connexion with organic arrangements.

Upon the subject of Physiology and the principle of Life particularly, Bichat has written much, and has added more original matter than any writer that has preceded him. His essential doctrine is, that there is no one single, individual, presiding principle of vitality, which animates the body, but that it is a collection of matter, gifted for a time with certain powers of action, combined into organs which are thus enabled to act, and that the result is a series of functions, the connected performance of which, constitutes it a living thing. This is the most simple and general view of life.

In considering the subject farther, he points out two remarkable modifications of Life as considered in different relations;—one common both to vegetables and animals, the other peculiar to animals. The one he calls Organic Life, and the other Animal Life. By organic life food proper for our nutrition is submitted to the operation of digestion, is thrown into the circulation, undergoes the action of the lungs, and is then distributed to the organs, to be applied to their nutrition. This is the life by which all parts of the body are kept in a state of repair; it is the life of waste and supply. By animal life, we become related to the world around us; the senses convey to us a knowledge of the existence of other things besides ourselves—we feel, we reflect, we judge, we will, we react upon external things by means of the organs of locomotion and voice, we become capable of communicating and receiving pleasure and pain, happiness and misery. In fact, by organic life we merely exist negatively—by the animal, that existence becomes a blessing or a curse, a source of enjoyment or suffering. For further differences between these two lives, I must refer you to Bichat's *Researches on Life and Death*, a work replete with interest. I have said thus much upon a subject about which we cannot have settled views. I have stated such as seem to me most correct, and as much as was necessary for my purpose, for it is by the agency of life that medicines operate, and have their actions modified.

In proceeding to speak of the *Modus Operandi* of medicines, I enter upon a field of controversy, in which every step has been



the subject of attack and defence—a field in which the contending advocates have been as irreconcilable, as partial and contracted views could make them. Theories having nothing for their support but the zeal and plausibility of their founders, built upon limited views of the subject, and the purport of which has been to bend all the operations of the system to suit their convenience, have been successively advanced. The decline of one has had no other effect than to give birth to another, equally slender in its structure and evanescent in its duration. I shall therefore adopt no theory, but avail myself of such facts as are known; and without confining myself to one system of organs, shall bring to my aid the support which can be afforded by other organs, in adding clearness, and I hope, more correctness to our opinions upon this obscure and intricate subject.

In commencing to speak of the action exercised upon the animal economy by medicinal substances, it is necessary to present to your view the various parts of the body to which it is customary to apply them. These are, 1. The Stomach and Intestinal Canal; 2. The Blood Vessels; 3. The Skin; 4. The Olfactory Nerves. Other parts are occasionally resorted to; they are the extensive surface forming the ærial passages of the Lungs, the interior of the Mouth, the Urethra and Bladder, and in women, the Vagina.

First. Their impression upon the stomach and intestinal canal. As the stomach is the receptacle of all that is taken into the system—as it is endowed with so large a share of nervous energy---as its connexions are so numerous and extensive, it must be obvious, that impressions made upon it, will be greater in degree than upon any other of the divisions I have mentioned. The stomach is possessed of powers which place it—I might say, could they be insulated---above those of any other organ of the body. These it derives not only from the important offices it performs, but from its seat and connexions. The nerves it receives from the brain and splanchnic ganglions, not only augment its sensibility to a very considerable degree, but favor the transmission by sympathetic connexions, of medicinal influences to every part of the body. Intimately connected with the head, the heart, the lungs, the stomach seems to divide with these organs the impressions which medicinal agents make upon it. Not only in a physiological point of view is this organ of the greatest importance, but it is no less so in a pathological. Not only is it affected in most diseases, but when diseased itself, derangement of the whole system ensues. Hence pains of all kinds succeed, in the head and limbs, with heat, nausea, loss of appetite, anxiety, and these symptoms constitute a disease which appears to affect the whole frame.

The two properties of the stomach upon which the impressions of medicines are made, are its sensibility and irritability. By the

former is meant that condition of the stomach which is fitted to have peculiar effects produced upon it by the action of other bodies, and which seems to lodge in every part of the nervous system. And that condition of the stomach by which certain parts are fitted to have certain motions of contraction excited in them by an impulse made upon the parts themselves, is called its irritability. I would therefore conclude, that the peculiar effects of substances in general, and of those substances we call medicines, depend upon their impression on the sentient and irritable parts of the stomach. But what is the nature of this impression? Is it merely an increase of the vital energies of the part, or does a change take place in their actions? That an increase of the energies of the organ takes place, is obvious from the phenomena which ensue. The capillary vessels become enlarged and distended with blood—the temperature of the part is increased—the secretions emptying into the organ are all augmented to a considerable degree—the muscular fibre is stimulated to contractions of a more vigorous and active character. This impression, it may be remarked, is not the same in all cases. It varies according to the quality of the article. It is different when excited by alcohol, by opium, by mercury, by jalap. It is modified in every variety of manner according to constitution, habit, the situation of the part, the nature of the stimulant, the state of disease. We cannot therefore, decide upon the exact nature of the impression—we only know that it is one of a decided character, consisting in an increase of the vital energies of the part, and that from them very important effects are derived in the treatment of diseases.

I may next inquire, whether to an increase of action produced by the impression of medicines upon the stomach there is not also a change of action? That a change ensues might be inferred from the circumstance, that medicines act upon the organized tissues of the body; these tissues form the organ, and execute the functions which are recognized as performed by that organ. A medicinal substance producing a change in the state of the tissue, in like manner produces a change in the movements of the organ to which this tissue belongs; the function therefore, which the organ performs, is executed in a different manner, and with particular modifications.

To render this point more clear by examples, I will state that emetic substances act upon the mucous coat of the stomach.—This, with the muscular coat, contributes to the formation of that organ, and from them are produced the functions or phenomena which appertain to it. The emetic, therefore, producing a change in the movements of the organ, its functions are performed in a manner different from what is usual, or are in other words changed. There can hardly exist a doubt but that such a change takes



place in the example just given, and the effect would be still more striking if the medicine instead of being taken during sickness, was administered to one in health. Many other examples might be furnished in which the disturbance of the organ is not so apparent, yet judging from the effects which follow the impression of the medicine, there would be as little hesitation in the conclusion. Such, in short, is the irritable nature of the internal surfaces that every impression is attended with some change. This change, according to the manner in which it is made, may either remove or bring the organ back nearer to the state of health, and it is only by such sanatory efforts being made, either locally or generally, that we can ever expect to restore the organ or system which has been deranged in its action, by the influence of morbid causes.

In considering the actions of medicines upon the stomach and alimentary canal, regard must be had to their Secondary as well as Immediate effects. The remarks I have made must be considered as referring to the latter. It is proper, therefore, that I should say a few words upon the *secondary* operations of medicines. These I need scarcely state, follow, as consequences of the impression of medicinal substances upon the alimentary canal. They are of infinite importance, and it is frequently to obtain their full influence on the system, that medicines are administered. It is to them that we are to attribute the relief which takes place in the developement, progress, and effects of disease—to them that we are frequently to expect the mitigation of some symptoms, the removal of others, and the entire change which is effected in the actual condition of disordered structures.

To illustrate these remarks by the action of several classes of medicines. The primary effects of emetics are the impression of the article upon the mucous coat of the stomach, the inversion of that organ with the upper portion of the duodenum, and the evacuation of their contents,—the secondary, the change which has taken place in the distribution of the fluids, the relaxation the system undergoes, the diminution of action, the reduction of the disease.

The operation of cathartics equally illustrates the above views. The effect of their impression is an increase of all the intestinal secretions, the serous in particular becoming augmented in a considerable degree, with those of the pancreas, liver, mucous glands, &c. From all these sources the discharges become very considerable, and the operation on the constitution, or the secondary effects, are exhibited in the diminished force and fulness of pulse, the reduction of inflammation wherever situated, the removal of pain, a more equal circulation of the fluids, the secretions more regularly performed—in short, the system under the influence of this new irritation of the intestinal surface becomes essentially al-

tered in its actions. These views may be further confirmed by considering the action of various other classes, of stimulants, narcotics, antispasmodics, epispastics, in all of which the secondary effects of the articles are of the utmost consequence in our treatment. These effects in some of the classes, as for instance the stimulants and even the narcotics, follow their administration so promptly, that we cannot readily draw a distinction between the first and second impressions; but though prompt, an interval may be conceived, since in every instance the action is first exerted upon the sensibilities of the stomach, from thence it is extended to the brain, and from thence to the system at large. The organs sympathising with the brain in the strongest degree, exhibit the influence of its action strongest—the heart becomes soonest excited and the increase of the circulation, the first evidence of its excitement. The nervous system is therefore the channel through which we most readily operate upon the general system, but it is not the only one.

The blood vessels, or the circulation afford another. Few subjects have undergone greater discussion than that of the Introduction of Medicines into the Circulation. The opinion that they entered the circulation, originated with the advocates of the Humoral Pathology, a doctrine which prevailed at different periods to a considerable extent, and of which the celebrated Boerhaave was the most zealous advocate. This doctrine attributed all morbid phenomena to the disordered condition of the fluids or humors of the body, and attempted to explain the progress and changes of diseases by certain fermentative or digestive operations of the humors. According to their several conceived conditions was the nature of the remedies employed;—they were denominated from the effects they were supposed to produce. Thus they were antacids and antalkalies, diluents, demulcents, inspissants, with others, as phlegmagogues, hydragogues, chologogues, etc., according as any of these principles prevailed, or any particular object was to be accomplished. Many of these terms are still retained, though employed in a sense widely different from what prevailed during this imperfect state of Pathology.

However erroneous were many of the conclusions drawn from morbid appearances, and which were adduced in support of this doctrine,\* still there are many facts in the production of diseases

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\* The occurrences adduced in support of this doctrine, were—the formation of chalk stones after inflammatory gout, the expectoration of purulent and mucous sputa in consequence of inflammation of the lungs and bronchial passages, and the buffy coat which is formed upon the surface of blood drawn in inflammatory diseases. These occurrences were adduced as the strong supports of this doctrine, and were supposed to be the peccant matter of the system which was eliminated and expelled in this manner. They are explained at present by a morbid action of the vessels of the part, on the system generally.



which cannot be explained otherwise than upon an altered, and I may say diseased condition of the fluids. The experiments of Dedier and Couzien prove that the blood and bile are morbidly affected in the plague. Dr. Francis Home practised the inoculation of measles with the blood of morbillous patients, in several instances with complete success. The communication of the small-pox to the fœtus in utero is inexplicable on any other ground. In the Memoirs of the London Medical Society, a case is related by Mr. Turnbull, of a lady who was inoculated in the seventh month of her pregnancy. Nine days after the eruption she received a fall, and in a few days after was delivered of a dead child, which was covered with variolous pustules in a state of suppuration. The matter was proved to be variolous, from its communicating the disease to several persons who were inoculated with it. One or two instances of a like nature are related by Dr. Hosack. It is also well known that the lues venerea is communicated from the mother to the fœtus utero. If then the poison of contagious diseases can circulate in the sanguiferous system without injury, why may not medicines also pass into the system with impunity?

The principal argument advanced against the introduction of foreign substances, is the change which all substances undergo, before entering the circulation. It is said that the glands, so commonly met with in the course of the absorbents, assimilate the fluids conveyed by their vessels, and prevent the passage of any foreign substance. Plausible as this statement may seem, the blood is however a very heterogeneous fluid, and were it my province I could satisfy you fully on this point. I am however to prove, that medicines, notwithstanding the above objections are frequently conveyed into the circulation, and though many authorities could be adduced on this subject, I shall content myself with experiments of Magendie, as repeated and confirmed by Drs. Laurence and Coates of Philadelphia. These experiments prove very satisfactorily that foreign substances are admitted into the circulation, and that by three several channels, viz: the branches of the vena portæ, the esophageal veins, and the lacteals. The article they experimented with was the Prussiate of Potash. This article, they observe, has advantages in inquiries of this kind, as being at once more easy of absorption, and of exposure by chemical means, of all the different substances they had tried. It was introduced into the alimentary canal of different animals, and after sufficient time had elapsed, it was tested in the thoracic duct, in the blood, in the urine, and found to exist in these several fluids.

Experiments made with solutions of the Sulphate of Iron injected into the abdomen, and the cellular tissue of cats and kittens,

evinced when the fluids of the thoracic duct, or the blood, or the urine, were tested with the Prussiate of Potash, the presence of iron. They likewise observe in their experiments with Camphor, that there is positive evidence that it may and does pass through the system of the blood-vessels. In two experiments with Assafœtida, this substance pervaded the whole system in a short time. They remarked, however, that the smell of assafœtida predominated in the mucous surfaces. From these experiments there can be no hesitation in admitting the introduction of foreign substances into the circulation.

Further discoveries have been made, and it was distinctly proved, that artificial chemical changes can take place in the fluids while they continue to circulate in living vessels, and the ordinary actions of life go on. To prove this point, a solution of the Prussiate of Potash was thrown into the abdomen, and a solution of the green Sulphate of Iron into the cellular tissue, in order to try whether the well known result of their admixture,—the Prussian Blue, would be produced in the vessels. This, however, did not take place, and the experiment was repeated, and varied, by throwing the Sulphate, as being of more difficult absorption into the abdomen, (where the process of absorption goes on with more facility,) and the Prussiate into the cellular membrane. On performing this, they were gratified by the striking result of a distinct and beautiful blue in the thoracic trunk and its contents, and in nearly the whole substance and surface of the lungs. These viscera were preserved in spirits. Thus, they add, not only foreign, but a pulverulent substance could present its unnatural stimulus, circulate through the vessels, and could accumulate in the lungs, without preventing the actions of life, and without occasioning coagulation of the blood. The experiments of Magendie, as confirmed by these gentlemen, whose character for talent and veracity entitle them to our highest confidence, may be considered conclusive on this subject.

We have, then, from the experiments of these gentlemen, the foundation laid for future researches, and for enlarging our ideas upon the operations of medicines. Their experiments will have contributed to form a new era in physiology, and will tend to form new and more correct views of the operations of medicines. They have opened to us other channels by which foreign substances may be introduced into the circulation, besides the lacteals—have proved to us that these substances are introduced into the circulation, and in a shorter period of time than could have been anticipated—and that they could exist there as chemical substances, without having their nature altered and animalized by the action of the vessels through which they have entered the system. These are points of primary importance in the investiga-

tion of our subject, and will doubtless operate powerfully in removing the prejudices which have long been entertained relative to the admission of foreign substances into the mass of circulating fluids. Hereafter, when we hear of sympathy, applied as it has been as the rationale of every change produced by the action of active agents upon the body, we shall listen with astonishment, and wonder at the credulity of the times.

Besides these articles, there are various others of the introduction of which into the circulation, the most skeptical cannot but be convinced. Of these are Potash, Soda and Nitre, which are carried into the circulation, and which may be detected in the urine. Let any person, says Dr. Paris, take several doses of Nitre, taking care that the bowels are not disturbed by the medicine, and he will find, by dipping some paper into his urine, and afterwards drying it, that it will defflagrate upon being inflamed, and indicate the presence of Nitre.

I might multiply facts and authorities to a greater extent, and not only relate results derived from an examination of the blood, but from the milk, the saliva, the urine, and the bones. Thus the urine is often coloured by taking large doses of Rhubarb or of Saffron; it is not only coloured, but acquires a peculiar odour from Asparagus. We sometimes discover in the perspiration the effluvia of volatile substances, as the Oil of Lemons, and other matters, which have been ingested. The pulmonary exhalation is frequently effected with the odour of Garlic, of Onions, of Alcohol, of Æther, of Camphor. The colouring matter of Madder is found in the excretions, and particularly unites itself to the bones.

We discover in milk, the bitterness of many plants, the acrimony of others, the fetor of others, when the animals which furnish it have fed upon them. These effects necessarily follow from the admission of foreign substances into the circulation. They have been proved to be admitted by the experiments I have detailed to you, and I might greatly multiply their number; but conceive that a single experiment detailed by an unbiassed individual, and conducted upon philosophical principles, worth a hundred others, the authors of which are unknown and their prejudices and views still more so. I shall go on to state that not only foreign substances may be introduced into the circulation, but that they may be injected into the veins, and produce effects similar to their introduction into the stomach. Thus we are informed by Haller, that a poison or medicine injected into a vein will produce certain determinate effects—as vomiting in the stomach, purging in the intestines, and drunkenness in the brain. From experiments made by Mr. Milman it appears, that solutions of Tartarised Antimony injected into the jugular vein, have produced effects similar to those produced by their introduction into the stomach. He



dissolved 15 grs. of Tart. Antimony in half an ounce of warm water, and injected it into the left jugular of a full grown terrier. In two minutes he vomited profusely, and appeared greatly distressed and debilitated. In twenty minutes violent vomiting and purging commenced—he became very weak, his stools passing involuntarily. In thirty-five minutes he expired. Solutions of Gamboge and Scammony produced the same effects as if they were introduced into the bowels. Effects corresponding to the nature of the article have followed from injecting solutions of Opium, Nitre, and other substances, and they have lately been employed in the treatment of diseases. Magendie has injected warm water into the veins of a patient afflicted with Hydrophobia, and solutions of Opium have been employed in Tetanus. The following case was taken from the *Philosophical Trans. Abridg.* Vol. iii. p. 234. We have injected by a siphon about two drachms of a laxative medicine into the median vein of the right arm of three patients in the Hospital of Dantzic. One of the patients was a lusty, robust soldier. He, when the purgative liquor was infused into him, complained of great pain in his elbow, and the little valves of his arm did swell so violently that it was necessary by a gentle compression of one's finger to stroke up that swelling towards the patient's shoulder. Some four hours after it began to work, not very troublesome, and so it did the next day, inasmuch that the man had five good stools after it. The other cases are similar in their results.

From the details I have given you, founded upon the experiments of very distinguished individuals, there cannot exist a doubt, that active substances may be introduced into the circulation in their original state, and that so far from being productive of ill consequences, that they may be made subservient to beneficial purposes. The advantages we derive through this channel in the operations of medicines, have not sufficiently been enlarged upon by medical writers. It is my firm belief, that many articles of moderate and feeble powers of action, those the operation of which is so gradual as to be necessarily continued for a length of time—those whose action is exerted upon organs removed from the centre of the system, as the kidneys, bladder, skin, lymphatic glands, genital organs, exert a beneficial effect through the medium of the circulation. In these cases, not only are the substances taken into the circulation, but the blood itself is changed, and by this means great changes are effected in the solids of the body. This is especially the case with some if not most of the tonics, particularly the preparations of iron; it is the case with all those articles termed Alteratives, whether of the vegetable or mineral kingdom, and it is particularly the case after long courses of mercury. In the last case the blood is observed to be not only more fluent, but

of a darker colour than it appears to be when taken from persons in health.

I am aware of the objections which may be made to the view that I have taken, and that it may be urged that the changes in the fluids can only be effected through the solids. This I shall admit in part, though not exclusively. Action and reaction are mutual—and while changes are effected through the solids—others, I maintain, are impressed through the medium of the fluids. The animal system is a complex structure, consisting of solid and fluid parts, whose influence upon each other is constant and mutual, and whose individual integrity is equally essential to the support of the general fabric. It is reasonable to conclude from such a view, together with the positive evidence there exists of the admission of foreign substances into the circulation, that the fluids may become morbidly deranged and involve the solids in disease, and that through either impressions may be made of a character calculated to obviate or correct these derangements.—*Medical Recorder.*

#### SUBJECT CONTINUED.

It may be observed, that all the natural substances which are medicinal, are not equally susceptible of absorption. They are not all taken up with the same facility by the vessels which perform this function. The experience of Tiedman and Gmelin proves, that the metallic salts, those of iron, of mercury, are expelled in the largest proportion with the fecal discharges—whilst the odour of assafoetida, of camphor, or musk, is not very sensible at the termination of the small intestines and in the large. The substances which are administered dissolved in a fluid, those which are presented to the orifices of the absorbents, united with the serum which is exhaled from the surfaces to which they are applied, are absorbed very rapidly, and with a facility which would not readily be conceived.

The saline preparations are readily absorbed, insomuch that infants at the breast are operated upon by saline medicines given to the mother.

The coloring matter of rhubarb, saffron, madder, &c. is readily taken up.

The Medicinal substances, on the other hand, which are given in a dry or pulverulent state, those the principles of which do not readily unite themselves to the fluids which moisten the mucous surface, enter with difficulty into the channels which ought to convey them to the mass of blood. Cinchona in substance an article of this description, Magnesia, Jalap. The absorption of these substances is therefore, difficult—they traverse the intestinal ca-

nal, and are to found in the large intestines. It sometimes happens, however, that a greater or less quantity of these articles penetrate into the system and are found mixed with the fluids of the body. The absorbents, as you perceive, are elective in their operations—or, to use the fashionable word of the day, they are eclectics.

I shall now offer a few considerations upon the conditions of the surfaces favoring or retarding absorption.

In the first place, it is necessary that the articles designed to be absorbed be closely applied to the mouths of these vessels. If the application of the substance is not immediate, it is excluded in a great measure from the system.

Secondly. The absorbents do not exhibit equal activity in every part of the intestinal or mucous surfaces. There are parts where their action is prompt, active, and very powerful; and there are others where they are inactive. The practitioner ought therefore to consider the condition, and the physiological activity of the surface, to which his medicines are applied.

Thirdly. The absorbing surfaces should not be in a diseased state; since this will modify necessarily the exercise of their action. Would it be possible to derive the same advantages from a surface in a state of relaxation, or which has its vital powers impaired, or otherwise irritated, as from a healthy surface?

Fourthly. The general condition of the system will also much impede the absorbent action. Magendie has shown that a state of plethora retards this function. He has shown at the same time that depletion from the blood vessels has restored this action to all its energy. This is an important consideration in the application of our medicines, since it proves that we cannot calculate upon the effects which depend upon the absorption of a medicine, when administered in a disease in which the pulse is strong and full, in which the blood is carried with energy into the extreme vessels; at the same time it will be seen that it is only necessary to reduce action, to deplete the vascular system, to restore to the absorbents their due degree of activity. These remarks become useful in the therapeutical application of those articles, which depend upon their introduction into the circulating system, before they become efficient. They show the impropriety of endeavouring to obtain the curative operations of medicines, in all conditions of the system, and the necessity of studying its various states, ere we can expect the same results. Thus it is admitted generally, that the preparations of Mercury are introduced into the system, yet all practitioners will admit the difficulty in many instances of affecting the salivary glands, the test of their action in highly excited states of fever.—*Barbier's Traite Elementaire.*



Having fully considered every point connected with this interesting division of my subject, I proceed to another. According to my arrangement I am to consider what action medicines exert through the medium of the skin.

The whole cutaneous surface seems to be endowed with some sensibility to impressions, and as it possesses an intimate connexion with the stomach and alimentary canal, the liver, and most of the other organs, it might be considered as one of the widest avenues to the introduction of diseases, and to the operation of remedial measures. Accordingly, it has long been the received opinion, that medicines applied in this manner were absorbed by the lymphatics, and thus conveyed into the circulation. But though such was the conclusion on this subject, I have no hesitation in stating, that I think it was embraced without due consideration; and as the subject has been examined within the last few years, with much accuracy and attention by several distinguished persons, I shall briefly relate the experiments upon which the opinion I have delivered has been founded.

The first experiments in opposition to the doctrine of Cutaneous Absorption are those detailed in a Memoir by Mr. Seguin of Paris, which were read before the Royal Academy of Sciences as early as the year 1792. In this memoir the author contends, that while the cuticle is entire, the skin does not absorb air or water.

Dr. James Currie was the next writer on the subject. His experiments and observations, as far as they go, are very satisfactory in disproof of the absorption of water by the skin—(See his *Treatise on Cold Water*.) In the year 1788, while at Buxton, he experimented on the effects of Bathing on the weight of the body.—He was weighed before entering the bath very accurately, and after remaining immersed for half an hour or more, he was weighed on coming out, when he found his weight rather diminished than increased. These experiments he repeated in baths raised to the temperature of 82° Fahrenheit, without any increase of weight being produced.

To these experiments it might be objected that the vessels of the system were full, and that no absorption would take place; yet that if the body was wasted from a want of proper food through the stomach, the plastic powers of nature would be employed to supply the defect, and to excite an absorption through the pores on the surface. To prove that this does not happen, Dr. Currie relates very minutely a remarkable case of Dysphagia, where death was the consequence of inanition, notwithstanding that the patient was placed in a bath of milk, and every other such method to support the system was employed. The patient on different occasions stepped perfectly naked upon Merlin's balance immediately before immersion, and again immediately after it, the body

being previously dried. The weights were never moved. The result was surprising, for Dr. Currie could not distinguish the slightest variation in the weight of the body, though the beam would have detected a single drachm and though the immersion had continued for an hour.—*Currie's Medical Reports.*

These facts are very strong in themselves against any power of the absorbents of the skin to take up water or other nutritive fluid. But though this point may be considered as settled by the experiments of Dr. Currie, it may still be questioned whether medicines may not be taken up by this channel and carried into the circulation, since it has been an opinion not only among the ancients, but among the most celebrated physiologists of the present time. It is known that tobacco applied to the skin produced sickness and vomiting, that opium produces sleep when externally applied; and these effects were all explained upon the supposition that the substances were absorbed and carried into the circulation. The experiments of Seguin and Currie seem to have directed a spirit of philosophical investigation to the functions of the skin, and the subject has been carefully examined in this country in a manner highly creditable to the several gentlemen so engaged. These gentlemen were, Drs. Klapp, Dangerfield, and Rousseau, who, in a series of well conducted experiments, have determined that the skin has no power of absorption in its natural condition—and that if it does ever absorb, it is only in particular situations.

The articles for their experiments were such as produce a characteristic impression upon some of the fluids of the body. Spirits of Turpentine was one of these, and its presence in the system is denoted by its communicating to the urine the smell of violets.—The manner in which the experiment was conducted, was as follows:—

The hand or foot was immersed in a vessel containing Spirits of Turpentine, and kept in it for an hour or more. At the expiration of this time it was removed, and in the course of a few hours the urine was found to be impregnated with the smell of violets. From this experiment it is evident that the Spirits of Turpentine was taken into the system, and that the test of its presence could be detected. It was, however, doubtful whether the Turpentine was conveyed through this channel or another suspected source, which was the lungs. To ascertain this point, the experiment was varied in some degree. A jar filled with Spirits of Turpentine was inverted over a mercurial trough, in such a manner that none of the fumes of Turpentine could escape. In this situation the hand and wrist were introduced into the jar of Turpentine, and kept there for an hour or more. It was then withdrawn, well washed, and in the course of an hour, the urine

was attended to, but there was not the slightest smell of the odour of violets to be detected. The conclusion therefore, which would follow from this experiment would be, that as in one instance the presence of Turpentine was detected in the urine when a part of the body was immersed in it, and while the fumes of Turpentine circulated in the atmosphere; and that in the other instance when a part of the body was equally immersed and the fumes prevented from rising, there was no test of the presence of the article in the system, that its introduction in the former case might be attributable to the vapour of Turpentine being carried into the lungs in the ordinary process of respiration.

To render the point certain, another experiment was instituted. A glass vessel containing a quantity of atmospheric air was inverted in quicksilver; three or four ounces of Spirits of Turpentine was introduced into it, and agitated with the air contained in the vessel in such a manner as to intimately mix the vapour with every part of it. A glass tube was then used, one end of which communicated with the air in the vessel, and the other end was taken into the mouth, and in this manner the air highly charged, was inhaled, without suffering any of it to come in contact with the skin. Upon examining the urine an hour and a half after this inhalation had taken place, it was found imbued with the smell of violets, and the smell was still stronger a few hours afterwards.

Similar experiments were made with various other substances—as Camphor, a strong infusion of Garlic, a decoction of Asparagus, without any test being discovered of their absorption by the skin. These experiments may be regarded as very nearly if not entirely decisive, and they clearly disprove cutaneous absorption in the healthy and undisturbed condition of the skin.

Besides, the structure of the skin is opposed to such a belief. For while it is admitted that the exhalents of the skin pierce the epidermis, and come in contact with the external air, the mouths of the absorbents terminate under it and are covered by it. By examining the skin with a microscope, it is discovered to be of a squamous texture, resembling in its arrangement the scales of a fish, and it is under these scales that the mouths of the absorbents commence. While it remains unirritated, and entire, no absorption takes place. When absorption does take place, the article must be forced by mechanical irritation under, the epidermis; and it happens that in particular parts of the body where the skin is thin and delicate, as the inside of the arms, and axillæ, the thighs, and genitals, absorption takes place very readily; or where this is not done, the epidermis has been destroyed by injury or disease—or if sound, the article is of an acrid nature, which first erodes the tegument, and comes in contact with the mouths of the absorbents.



The experiments of M. Seguin confirm the above opinion. He dissolved in the water of the bath in which he made his experiments, substances which produce a specific effect upon the system, by which absorption might be ascertained. He employed the Per chloride of Mercury, in solution, on a number of venereal patients, and while the epidermis was entire, he never perceived a single instance of salivation, or even amendment to their complaints. But when the epidermis was destroyed, as in ulcers or the itch, the specific effects of mercury on the system were soon produced. It is unnecessary to state that the doctrine of cutaneous absorption is a subject of doubt and discussion among physiologists, many still asserting that it does take place. In a note to Meckel's Descriptive Anatomy, it is even stated that Lauth, Jr. has succeeded in injecting the cutaneous lymphatics with quicksilver; but as no details have been furnished, neither has the work reached this country, I have not changed the opinions I have delivered on this subject. These opinions have been confirmed by those of Beclard in his Descriptive Anatomy, who observes, that in the experiments and observations in favor of this absorption, it may have taken place by respiration as well as by the skin. In other cases in which the epidermis has been softened, altered, or abraded by continual applications to its surface, or repeated rubbings, absorption is no longer cuticular, but of the same kind as that which takes place in the mucous membrane, or by inoculation, when the matter is carried through the divided epidermis into the corpus mucosum, and even into the dermis, both parts being eminently absorbent. When this is done, there remains a small number of facts which show, that certain substances are absorbed by the skin through the epidermis in its entire state, but that this membrane is truly an obstacle that very often prevents the absorbent power of the external tegument.

Having shown that the supposition of absorption by the skin in a natural state, and the effects upon the system which were derived from this source, were gratuitous, it remains for me to point out in what manner impressions attributed to this source, are communicated to the system. These, as I have already hinted, are in some degree by the lungs, but they are also in a very conspicuous manner by the *olfactory* nerves. The influence which these nerves exerted over the system, had been obscurely hinted at by former writers, and the practice so general of applying amulets round the neck, and other customs among the common people may have had its origin in these opinions so vaguely delivered. To the industry and ingenuity of Dr. Rousseau, we are indebted, for reducing to a certainty what was only speculation, and opposing by experiment what had formerly been a subject of conjecture.

For this purpose, he employed a number of articles which were known to produce the most unfriendly effects upon the system—as Tobacco, which we know when applied to the skin in the form of a cataplasm produces vomiting; Ardent Spirits, the fumes of which when inhaled produce intoxication; with other articles of a like nature, and could by a variation of his experiments either excite, or prevent these effects taking place.

In order to test the effects of Tobacco, a stout Irishman unapprised of the intention of this experiment, was hired for this purpose. His nose was made impervious with lint secured by adhesive plasters. A bath of a strong decoction of Tobacco having been previously prepared, he was put into it, and remained in it up to his navel for one hour and a half without evincing the least symptom of nausea, or any other uneasiness, whereas the bystanders called to witness the experiment laboured under such a degree of nausea as to be put to the necessity of leaving the room, and some of them suffered from severe vomiting. A child seven years of age was plunged up to the neck, and remained in a bath of the same kind for two hours, his nose being secured, and suffered so little inconvenience that he ate cakes.

A lady of delicate constitution, extremely prejudiced against the smell of tobacco, having been repeatedly sickened by the breath of gentlemen chewing this vegetable, was induced to try the experiment. She first convinced herself that when her nose was closed there was nothing nauseous. A quantity of tobacco leaves having been put into a large pan with a gallon of water over a chafing dish, and suffered to boil for some time, she breathed the fumes through her mouth, holding her nose with her fingers for half an hour, without experiencing the least nausea. Similar experiments were made with the fumes of Ardent Spirits, and the results were conclusive. The vapour from the liquor being inhaled for an hour or more with the nose secured, without any other sensation than a smarting of the throat occasioned by the fumes. The same experiment repeated the next day without the same precaution, for half an hour, produced so much giddiness that the person begged to be excused, declaring that he felt so giddy he did not think he could stand, and actually staggered in going to a chair.

From these experiments we have strong reasons for concluding that the vapour of volatile substances, and of many other applications which are made to the skin, instead of exerting their action through this organ, have their effects impressed upon the system through the medium of the olfactory nerves. These experiments are highly interesting in a practical point of view, as well as illustrative of the utility of many applications to the nostrils in common practice—as volatile substances in syncope, and applying a

handkerchief, or piece of fine cloth, or gauze, before the organs of respiration, when passing through swamps or other offensive places, so as to intercept insalubrious particles which are mingled with the air breathed—since it is highly probable that it is from the impression of these particles upon the Schneiderian membrane of the nares, fauces, and also upon the delicate passages of the lungs, extended to the brain, that a foundation is laid for disease.

The other surfaces to which medicines are applied will not at this time be considered separately, but will be treated of when speaking of the articles which act upon these surfaces, in the course of the Lectures.

The consideration of the *Modus Operandi* of medicines would be incomplete, were I not to say a few words upon their Sympathetic action, a subject so much enlarged upon by the Solidists.\* You are aware that even at the present time Professors Chapman and Caldwell have attempted to explain all the operations of medicines by the influence of sympathy. After the details and experiments I have laid before you, the absurdity of such an opinion must be manifested. Still, however, I would not wish to be understood as rejecting the sympathetic actions of medicines, but on the contrary would state, that through this channel many of the changes which take place must be explained. I have already alluded to the subject, but before concluding will make a few other remarks. The origin of the term. The term *sympathy* is inappropriate in medical phraseology. It is itself a term of vague and indefinite character, and is more properly applicable to the interchange between mind and mind, than to impressions of a corporeal nature. It is used however in both senses, and in a medical point of view has reference to the changes occurring in parts of the body remote from each other, through the medium of the nervous system. That a connexion exists in physiological relation between the different parts of the system, numerous facts in health and in disease could be adduced. To enter into their details would be outstepping my limits, my province being to adduce examples of such medicines as have their actions exerted through this channel.

The medicines which extend their influence to the system, by means of sympathetic connexions, make an impression more or less considerable upon the part to which they are applied. They change at first the vital operations of the gastric organ, and give to the nerves of this part a new action, which is extended to the whole cerebral system. That such is the case, will be obvious

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\* The Solidists are that class of physicians, who refer all changes in the system to the immediate influence of the *solidum vivum* or living solid. They are, as may readily be conceived, directly opposed to the Humoralists, and may be considered as dating their existence as a distinct sect from the time of Hotiman, who flourished in the beginning of the eighteenth century, 1730.



by causing a person to take a potion containing Laudanum. The changes which I have represented as succeeding, are soon exhibited, and it is then that we observe spasmodic actions to subside which exist in remote parts. The medicinal substance makes an impression upon the surface which receives it, and it is this impression which excites the sympathetic actions. From this point may be said to go out the changes, which are to be propagated to all other parts of the system. Effects similar in many respects may be said to attend the introduction into the stomach, of ardent spirits or other stimuli. A local impression being first produced, and this becoming extended through every part of the system. Upon similar principles we explain the action of Bark in arresting an approaching intermittent when given before the expected paroxysm, or Digitalis in speedily reducing the action of the pulse. Examples might be furnished from other classes.

It is always to the cerebral and nervous systems that we should apply for an explanation of the transmitted impressions of medicines from one part to another. All new or unaccustomed impressions excited in the organs of the body, are extended to the brain, and from thence to the rest of the system. All the parts of this great system have an intimate relation—the brain with the spinal marrow and ganglions, these with each other, and through their diversified ramifications with the whole organized structure. Strictly speaking, therefore, every article taken into the system, whether medicinal or otherwise, excites this extended chain of action, and therefore, those attached to the doctrine of sympathy, might argue that every thing operates by sympathetic action. To maintain, however, that there is but one action common to medicines, *i. e.* Sympathy, is to contend against all the discoveries which have been made in physiology, in the action of the absorbents, and of the numerous facts which have been discovered on this subject, and not only betrays ignorance, but violates all the rules of true philosophy.

When wishing to avail ourselves of the advantages to be derived from sympathetic influences, it is important to consider the extent of the impression which the agent makes upon the part of the body to which it is applied, and to study the relations which this part maintains with the rest of the system. As every agent is not equally adapted to bring into action the play of the sympathies, so neither is every part of the body to which the agents are applied alike capable of exciting them. As I shall point out hereafter, some parts are infinitely better adapted for exciting the sympathetic actions than others. Not only is *the part* to which they are applied of importance, but *its condition* should also command our attention. Thus when the sensibility of the gastric surface is enfeebled or torpid, the sympathetic effects of medicinal

agents are less marked, and are produced with more difficulty.—Is the same surface inflamed, and therefore more sensible? The sympathetic effects of medicines are more prompt and more intense. The condition therefore, of the Gastric surface, will modify very considerably the effects of our medicines, and should be carefully considered when they are administered. Destroy the sensibility of this surface, and the effects of our agents are alike destroyed. M. Dupuy has introduced into the stomach of a horse after dividing or placing a ligature upon the eighth pair of nerves, two ounces of *Nux Vomica* rasped fine, and made into a bolus, and no effect has been produced. The same quantity given to another horse, which had not undergone this operation, has caused death in a few hours, preceded by convulsions and Tetanic spasms. It is evident, therefore, that with medicines acting upon the nervous system, and with others which are absorbed before their effects are manifested, the actual condition of the vital parts to which they are applied must be considered of infinite importance. It is this which modifies the action of our remedies.—Their impression is always the same; there operation would, therefore, be uniform, were there not countervailing causes chiefly arising in the state of the parts, to which they are applied, which renders feeble, partial, or inert, or violent, dangerous, or painful, the means we make use of. Complaints are frequently made of the uncertainty of our remedies. Where they are of a good quality, their effects are the same. They are modified by the vital condition of the part to which they are applied, on the general system,—and the anxiety of the physician should be exhibited in studying their morbid conditions, and either adapting his remedies to the state of action, local or general, or adapting the constitution (a more difficult task) to the remedy. The former can only be obtained by a knowledge of the pathological derangements which are caused by the disease, or connected with it, and which can only be acquired by the study of pathological anatomy—and the latter by attending to the various indications pointed out by the pulse, the temperature, the secretions, the sensations, &c.

REFERENCES.—*Barbier's Traite Elementaire*; *Currie's Medical Reports*; *Caldwell's Theses*; *Cyclopedia of Practical Medicine*.



#### UPON THE ADVANTAGES TO BE DERIVED FROM A COMBINATION OF MEDICINES.

THE present subject is as important as any that will be brought before you, but it is one upon which little has been written. The ancients have left us scarcely any thing; and it is here and there only, that it is alluded to, without any definite directions, or any

reasons assigned for combinations of this nature. The attention which has been paid to this subject is altogether of modern date, and though something was done during the close of the last century, in a very interesting paper by Dr. Fordyce, to arrange and systematize what had been furnished by experience and observation, yet it is to the exertions of a very recent writer, Dr. Paris, that the few and scattered principles which were known, have been collected together, and with the aid of genius been made to assume a scientific form. It may be matter of some surprise, that such an undertaking should have been reserved for this period; and acknowledging as we do, the beneficial operation which results from a union of medicines, that such facts as were known, should only now have been embodied. I am at a loss to assign any reasons for this neglect, particularly as the combination of medicines has for a very long time been practised. The prescriptions of the ancient physicians which have come down to us, contain a great number of medicines united together. Of this nature was the celebrated Theriac and Mithridate, remedies which contained from forty to sixty ingredients, and which were supposed to be efficacious against poisons and a great variety of diseases.

The Theriac is still employed by the French physicians. The general composition consists of a mixture of excitant with narcotic substances, in the proportion of a grain of the latter to a drachm of the compound. It is directed in doses of x. xx. or xxx. grains, as a gentle stimulant to the organs of digestion. It is thus employed as a Stomachic, and is also recommended in diarrhœas, dysenteries, and in colics.

The Mithridate in Pharmacy was a composition in the form of an electuary. It was formerly a capital medicine in the shops of the apothecaries, being composed of a number of drugs, among which were opium, myrrh, ginger, saffron, cinnamon, etc. It was considered cordial, opiate, stimulant, and alexipharmic. It takes its name from Mithridates, king of Pontus, who is reported to have so fortified his body against poisons, with antidotes and preservatives, that when he had a mind to despatch himself, he could not find any poison that would take effect. The recipe of it was found in his cabinet written in his own hand, and carried to Rome by Pompey.

These articles are not mentioned for their utility, but to illustrate the extent to which medicinal combinations were practised.

The same disposition seemed to have existed among the Romans, as may be seen by referring to Celsus, and to have been extended to the Arabian physicians. The practice was continued even to the last century, and we find in the writings of Dr. Huxham, a great variety of articles united in one formula, and some of his prescriptions are extant, which contain from one to two



hundred ingredients. The utility of such multifarious compounds has been so much doubted within the last few years, that we may be considered as having gone into the other extreme, and instead of mixing medicines, have been often satisfied to exhibit them singly. The purport of these remarks will be to show, that by combining medicines, the energy of our practice can be much increased, (not but that many indications may be fulfilled by employing single substances,) but by uniting them to a proper extent, greater activity will be afforded by the compounds, not otherwise possessed, and in some instances we may give rise to remedies of entirely new powers. Dr. Ferriar observes, that though it may appear fanciful to many persons, yet he has been led by observation to suspect, that there exists in the relative effects of medicines, something similar to the harmony of colours and sounds; and that the impulse requisite to the living powers of the body, which cannot be produced by a single impression, may be affected by a concurrence, or succession of impressions, in some degree dependent upon each other.

The division which I shall make in treating of this subject will be, first, to consider the benefits derived from the union of Substances of a Similar Nature, and then, the benefits from the union of Substances of a Different Nature. Before proceeding to treat of either of these divisions, it may be proper to consider what is the constitution of a formula consisting of more than one article. In every compound formula we distinguish, most commonly, a *base*, an *auxiliary*, a *corrective*, and a *form*, under which it is exhibited. By the *base* or *basis*, is understood the medicinal substance which prevails in the formula—that of which the action is principally remarkable, which excites the physiological phenomena in a manner most apparent, and which in short distinguishes most of the effects which follow the use of the medicine. To determine the ingredient which forms the base of a pharmaceutical preparation, we are not to consider merely the bulk or the dose of the medicinal substances which enter into its composition; but the comparative activity proper to each of them. Often the substance which enters into the mixture in the proportion of a few grains is the base, because it gives energy to the action of the other substances, and it is to its influence that we perceive the effects derived from the mixture.

The *Auxiliary* is a substance mixed with the formula to augment the activity of the base, to give more intensity to the effects which it is capable of exerting. The auxiliary ought always to conform in its properties with the principal ingredient of the compound in which it enters. It is necessary that their impression upon the vital organs should be of the same nature and have the same character, that joining its action to that of the

base, it may give to the medicine more extended and important effects.

The *Corrective*, or corrigens, is an ingredient in a pharmaceutical compound, which has for its office to moderate the too great activity of the medicinal substances, among which it is placed. It becomes necessary, when these form their action are likely to produce unpleasant effects, or when carried too far would pervert the intended action, and defeat the objects of the exhibition. The last circumstance is the *form* under which the medicinal substances are best exhibited.

The prominent features of every compound formula being thus noticed, I shall proceed, first, to consider the advantages derived from the union of substances of a Similar nature. That a union of these substances gives greater activity to the compound than they possessed in their single state, is proved in a variety of instances. We will consider the effects of this union in promoting the action of Purgatives. All purgatives have not the same effects, though they all produce more frequent and more copious evacuations from the intestines than take place in health. Let us examine into the manner in which the differences of their operation may be so united as to result in the formation of a more useful formula. For example, Sulphate of Potash, or Soda, or Magnesia, operate more quickly than Aloes, Rhubarb, or Jalap. These last medicines, however, occasion an evacuation of fæculant matter, while the former most commonly occasion discharges of serous fluids. If an evacuation is wanted sooner than would take place from employing aloes, rhubarb, or jalap, at the same time an evacuation of fæculent matter it would evidently be better to mix any of these saline preparations, with the rhubarb, jalap, etc., than to use the last alone, or either of the salts alone. Such a mixture is, therefore, found to produce a quicker evacuation, and at the same time a more fæculent one, than when any of these medicines are given separately. That such is actually the case, the experience of every practitioner testifies, and many will concur with me in the beneficial operation of the Sulphate of Potash, (as being more agreeable than the other salts,) in conjunction with Jalap or Rhubarb. By this union, the action of the Jalap is quickened, its griping tendency obviated, and a smaller quantity of the substances is sufficient. This example will furnish us an instance of the basis of a prescription and its auxiliary. The Jalap being the more active article, is entitled to the former consideration; the salt is the auxiliary, as it augments the activity of the base. Similar beneficial effects result from the union of Jalap with Calomel—of Senna with Salts. It is upon the union of several articles of a similar nature that we explain the activity of sea water, of several mineral waters, the sum total of these

ingredients in a given quantity being much smaller than we should have supposed. Sea water and mineral waters owe their activity to the number of ingredients they contain in connexion with their free dilution. The proportion of the active articles is so very small, that it is only by their combination that their peculiar effects take place. Gamboge combined with Aloes, forms a compound exempt from the objections arising from the too rapid solution of the one, and the slowness of the solution in the other. In like manner combinations of rhubarb and Sulphur, or other articles, are more effectual in keeping the bowels free of fæculent matters in fevers, than either of them exhibited singly. These examples may be extended, and doubtless your experience will suggest to you the beneficial effects of a union of medicinal forces as pertinent as any I have mentioned. The remarks offered are applicable to Laxatives, and equal advantage arises from mixing several of them together. When one laxative is employed, and in a sufficient dose, it is apt to produce sickness and pain in the bowels, and it is uncertain in the degree of its operation. When several are mixed together, they are much less apt to produce these effects, and are much more certain in their operation. For instance, Manna, when given alone in a sufficient dose, produces considerable sickness and uneasiness in the bowels, excites colicky pains with a disposition to acescency—yet combined with Senna, Cream of Tartar, or the Sulphate of Magnesia, it forms a pretty active and by no means unpleasant medicine. The truth of these observations is strongly illustrated by the following combination:—12 drachms of Cassia pulp are equivalent in purgative power to 4 ounces of Manna; yet if we give  $\text{ʒviii.}$  of the Cassia pulp with  $\text{ʒiv.}$  of Manna, we obtain double the effect of a full dose of either.—*Paris' Pharmacologia.*

From the tenor of these remarks it is obvious that a union of several similar remedies will produce a more certain, speedy, and considerable effect than an equivalent dose of any one. This is so uniformly the case, that it is established as a law in relation to pharmaceutical operations. We will consider its application to other classes of medicines. Among Emetics, we will find that the union of Ipecac. with Tart. Antimon. affords a more efficient medicine than either alone. Ipecac. more certainly produces vomiting than Tart. Emetic, the latter not unfrequently passing downwards and affecting the bowels; by mixing them, therefore, the certainty of emesis is secured, while from the greater energy of the antimonial preparation, more copious discharges are produced, and a crisis of the disease more speedily effected. In like manner in cases of poisons being swallowed, it is better in order to produce vomiting quickly, to mix the Sulphate of Zinc and Ipecacuanha than to employ either of them alone. The Class of To-



nics will furnish us many illustrations of this law equally satisfactory. Medicines of this class, as the cinchona, cascarilla, the several species of carduus, chamomile, the rinds of fruits of the orange kind, the gentians, and many others, agree better with the stomach and tend more to strengthen the system when mixed together, than when any one of them is employed. The utility of this practice seems well established, though we are at a loss to explain the changes which take place among the medicinal compounds.

I shall detain you with one other example of the utility of a combination of substances of a similar nature. The instance to be adduced is among that class of medicines called Alteratives.—The articles belonging to this class are possessed of properties very analogous, being stimulating, subtonic, and diaphoretic.—They are very numerous, and are resorted to in protracted affections, in impaired conditions of the system, in obstinate ulcerations, and local diseases generally. They are termed Alteratives, since from their long continued use they seem to alter the condition of the solids and fluids, and by their tonic impressions improve the vital energies, and promote the process of secretion in the various parts of the body.

The articles of this class are not only derived from the Vegetable kingdom, but some of the most powerful are obtained from the Mineral. This class of medicines I have had frequent opportunities of employing, and consider them very valuable additions to the *Materia Medica*. Useful as they are occasionally found to be when given separately, from repeated trials I am satisfied that their good effects are greatly increased, and rendered more certain by combination. Upon this principle some of the oldest and most popular formulæ have been established, as the Lisbon Diet Drink or Compound Decoction of Sarsaparilla, the Syrup of Sarsaparilla as given in the French Codex, and the Sirop de Cuisinier. To which I may add a preparation originally made in imitation of Swaim's Panacea, but which I have found to possess properties much superior, and the particulars of which I shall relate at a future period.

The remarks I have made, apply to the union of articles of the Vegetable kingdom, but they are rendered more striking by uniting those of the Vegetable and Mineral kingdoms. Swaim's Panacea owes its efficacy to the union of vegetable and mineral alteratives, since it has been found to consist of Corrosive Sublimate or Perchloride of Mercury, added to a concentrated decoction of Sarsaparilla and other alteratives.

The observations which have been made upon these classes, might be extended to all the rest of the *Materia Medica*.

It should be observed, however, that through the application of this law, that of uniting articles of a similar nature has been advocated and its utility supported in a variety of instances, yet it is only designed that it should be practised within moderate limits. By multiplying these ingredients to an unreasonable extent, we would, instead of rendering the compound more agreeable to the stomach, excite disgust, and "so reduce the dose of each constituent as to fritter away the force and energy of the combination." Before concluding this division, I will further illustrate the utility of the principles, by a very familiar example, furnished by Dr. Fordyce. In the preparation of food, when the object is to make the stomach bear a large quantity, without exciting sickness by adding spices to it, it has been the uniform practice of all nations never to employ one spice alone, when two can be procured, and even to mix a greater number together. Pepper alone, ginger alone, cinnamon alone, garlic alone, or any other spice or stimulant alone, would not render any kind of food capable of being retained in the stomach and in so large a quantity, as when these spices or stimulants are mixed together.

The second division of my subject consists of the union of Substances of a Different nature. A combination of medicines of this description, though the principles upon which they are regulated are more obscure, furnish us with the best formulæ for contending with disease, and for alleviating distressing symptoms as they exist. They are often extemporaneous in their formation, and many of the most favourite compounds have been the result of accidental mixtures, originating in particular states of disease, or the experience of the individual. Combinations of this nature enlarge and extend the sphere of our remedial operations, and are subservient to many useful purposes.

1. They enable us to contend with several symptoms of a disease, or produce two or more different effects at the same time, in a manner which is not oppressive to the patient.

2. They are further useful in promoting the operation of particular medicines.

3. They, in some instances, give rise to compounds of entirely new powers.

These beneficial effects are best illustrated by particular examples. Under the first head I would observe, that in cases of severe diarrhœa, where the object is to check the morbid discharges from the intestines, at the same time to relax the vessels of the surface, we combine an astringent and diaphoretic medicine.—In this case we may employ Tormentil or Kino, or other article to act as an astringent upon the intestines, and small doses of Ipecac. to relax the vessels of the skin. These two operations being accomplished, the disease readily yields. We effect the same ob-

ject by the administration of the Dover's Powder, which is probably as useful a compound as could be selected in this particular disease. The Opium in this instance exerts an astringent joined to an anodyne operation, and the nausea excited by the Ipecac. tends strongly to divert the current of morbid action from the intestines to the surface.

Another instance of the same mode of action, is the once much famed composition of Dr. Moseley, called the Vitriolic Solution, which consisted of the Sulphate of Alumina and Potash, and the Sulphate of Zinc; their combined operation resulted in a diminished secretion from the bowels, and an increased discharge from the surface. The utility of combinations with a view to produce two or more effects, is illustrated in cases of severe spasm of the bowels. When the object is to lessen pain and muscular contraction, and to excite free discharges from them, the union of Opium with Calomel in large doses, in such cases, is more beneficial than any remedy which is employed. In the treatment of Dropsies we have often two indications to fulfil—to evacuate the water, and to support the strength of the patient. Hence the necessity of combining stimulating cathartics with active tonics; and under these circumstances I have often derived great advantage from the union of the Crystals of Tartar with an infusion of Quassia Wood. In the same disease, when it has been of long duration and depleting remedies become necessary, stimulants are required to support the system under their operation. Here a solution of Gamboge in Sulphuric Æther will be found to promote our intentions very fully.

These examples illustrate the point under our consideration, and though their number might be increased, and the practical benefits derived from a more extensive combination pointed out, yet other objects remaining to be brought to your view, I can only allow to myself a rapid survey of the whole. I regret this the less as these examples will be presented to your notice at a future period.

2. The next advantage derived from the union of different medicines, is the change which takes place in their composition by which their operation is promoted. This change consists often in an increase in the solubility of the substance by the vital energies of the stomach and intestinal canal; and it is probably owing, Dr. Paris observes, to the diversity which exists in the solubility of the active elements of purgatives, that so great a difference occurs in their operation. To this it is owing, that some cathartics operate as emetics, and that others exert but little action upon the small intestines, but have their whole force expended upon the colon and rectum. It is probably owing to this circumstance that some article, are more liable to produce griping, and other unea-



siness in the bowels, from the principles of their activity refusing to be softened, or otherwise acted upon by the energies of the *primæ viæ*. From the foregoing I would inquire, whether many substances now considered inert may not be rendered active, and activity of others increased, provided more attention was paid to medicinal combinations? The subject is obscure and still in its infancy; but it will always continue in these states, provided the intimate mixture of medicines, and their effects, are not more attended to. I cannot but hope this notice will not be lost upon you. That the insolubility of medicinal substances is changed by a union with others, a few examples will sufficiently illustrate. Aloes, which we know passes through the bowels, and exerts its action upon the rectum, has its solubility increased, and its powers of action quickened by being combined with Gamboge. The purgative property of Senna, residing in a bitter extractive matter, which is comparatively insoluble, and on that account probably liable to produce griping, has these effects corrected by being combined with Salts, or an Alkaline Salt. Infusions of bitter vegetables have their virtues improved by the addition of Soda or Potash, which operate by rendering the bitter principles of more easy solution and consequently more efficient.

3. The last of the objects to be considered in the combination of medicines, is the formation of compounds of entirely new powers. This is effected either by a mixture of such substances as exert an antagonizing operation upon each other, or it is the result of chemical actions, altering and newly blending the different principles of the compound. An instance of the first, I would mention, that the preparation usually called Dover's Powder affords an example of the union of two substances producing effects different from either. The narcotic operation of the Opium is obviated by the tendency of the Ipecacuanha to produce relaxation of the surface; and the diaphoretic operation of this last, is augmented by the stimulus of the Opium giving excitement to the action of the heart and arteries—the result, therefore, is a diaphoretic of great power and extensive utility. As instances of the chemical actions producing new products, I may mention the change produced in colour, and properties, by the union of an alkali, as the Carbonate of Soda or Potash with Rhubarb—the formation of an Acetate of Zinc from the union of the Super-acetate of Lead and Sulphate of Zinc, a product supposed by many to possess properties superior to either—the neutral mixture, as it is commonly called, or the Acetate of Potash—the black wash formed by the union of Calomel and Lime-water. To these may possibly be added many important and interesting illustrations from a more extended knowledge of vegetable chemistry. Such are a few of the facts, which have been collected together, upon the

subject of Medicinal Combinations. They are calculated, I trust, to direct the attention to its consideration in a greater degree, than has generally been done, and to prove in many instances the utility of employing compound, rather than single prescriptions.—These remarks become the more necessary, since in the view of the late Dr. Rush, but a very few articles were considered necessary to contend with every form of disease—and that armed with Calomel, Opium, Tartar Emetic, and a Lancet, physicians could encounter all the ills to which flesh is heir.

REFERENCES.—*Some Observations upon the Combination of Medicines*, by G. Fordyce; *Paris' Pharmacologia*.



#### ON BLOODLETTING.

PREVIOUS to my entering upon the consideration of those agents, which, acting upon the several organs of the body, promote their secretions and thereby lessen the mass of blood, it may be useful to bring to your view the effects which are often derived by the immediate abstraction of blood from a vein. In this respect, I shall be extending the lists of agents commonly comprehended under the *Materia Medica*. No apology is required for this innovation, as it has always been a matter of surprise, that in the various treatises upon this subject, comprehending the enumeration of the many remedies for controlling or modifying diseased actions, so important a remedy as bloodletting unquestionably is, should have been overlooked. Combining so many advantages, from the promptness of its operation, its effects upon the system, not only in abstracting from the quantity of the circulating mass, and a consequent abatement of activity in the sanguiferous system, but by the impression it makes upon the brain and nerves, and upon the lymphatic vessels, it comes to be ranked among the most important of our remedies, the one which can with safety be appealed to in emergencies which threaten the overthrow of the animal fabric, or the derangement of its structure and functions. For these reasons I shall review the several states of disease in which it becomes applicable, with the circumstances and conditions of the system which render its employment safe and proper. It is only with the consideration of Bloodletting as a remedy, that I shall endeavour to engage your attention; the very interesting speculations upon the subject of the blood, with the manner of performing the operation, must be detailed to you from other chairs.

The art of bleeding may be traced back to the remotest antiquity, and seems to have been common among the Egyptian, Ara-

bian, Greek, and Latin physicians, even at a time when Anatomy had never been, or but little cultivated. The Greeks boast that Podalirius, the son of Esculapius, was the first who practised bleeding, soon after the siege of Troy, and it is even probable that it was practised before this period. How it came to be adopted, can not be known at this distant time. Pliny, indeed, supposes that physicians first learned this operation from having observed the Hippopotamus draw blood by pushing sharp reeds into its body. But this is very improbable, as there is but very little analogy between the artificial opening of a vein with a lancet, and the random wounding of an animal by friction against a broken reed. However the practice originated, mankind were soon convinced of its importance, and it has, I need not inform you, been continued with an increase of advocates to the present day. The most distinguished of these have been Botallus, De Haen, the celebrated Sydenham, Pringle, our countryman Rush, Dr. Armstrong, whose strong powers of reasoning place him in close alliance with the earlier recorders of disease, with many others who have added the tribute of their approbation to its beneficial operation.

With these preliminary remarks, I shall proceed to the application of bloodletting to diseases.

This remedy is undoubtedly the most direct means of diminishing the quantity of fluids in the system, and consequently of lessening the vital energies. To abstract that fluid, which is the immediate pabulum of life, cannot, it is obvious, be a matter of indifference to the constitution;—if it be the most powerful means of influencing the vital actions, so it is the most dangerous when improperly employed;—if it is the most effectual mode of diminishing excitement, it is consequently the most apt to induce extreme debility. A cautious consideration of many circumstances is therefore necessary in determining upon its propriety. These considerations become the more necessary, when the nature and character of disease are duly contemplated. They consist, for the most part, in certain determinate actions, which, unless early arrested, have a strong tendency to run their course. This is particularly the case with the febrile affections generally, and it is in such cases, that the propriety or impropriety of bleeding is more especially manifested.

Bloodletting, in its operation, is either *palliative* or *curative*, and is directed in disease as one or other of these objects is to be accomplished. This distinction should be kept in view, particularly in the management of Febrile or Inflammatory affections. For the curative operation used in the commencement of these diseases, and carried to a considerable extent, the subtraction of a large quantity produces such a change in the constitution as frequently to arrest the course of a febrile affection, or lays the case



open to the action of other powers which restore health quickly, and often completely. Thus employed, it has often been found extremely advantageous, and though the quantity necessary to produce this effect might often be thought dangerous, yet employed with judgment and discrimination, bad effects will seldom ensue. Indeed it is a matter of surprise to what extent it may be carried in the concentrated forms of disease, particularly when the head is affected, without any ill consequences. In the Island of Barbadoes, Dr. Jackson asserts, that in the febrile affections of 1813 and '14, the quantity abstracted was rarely less than 3 pounds, frequently 4 or 5, sometimes 6. The vein was even sometimes re-opened at a short interval, the blood allowed to flow 4 pounds additional, amounting in all to *ten pounds* in twenty-four hours. It is unnecessary to say, that such practice is not generally advisable, and I am glad to say that it is not often called for; but I have introduced it to show to what extent depletion by this channel can be practised, and in some forms how necessary it is to push it to the greatest extent, if we ever design to arrest the course of disease. To effect this object, one large bleeding is more beneficial than several small ones. Small bleedings diminish violence and avert the destruction of organic structures; they do not prevent the diseased action from proceeding through the regular process of what is termed coction, to a constituted period of formal crisis; but as prevention is the professed and proper object of the physician, the decisive means, if they are at the same time the safe means, are those which ought to be adopted.—*Jackson*.

The utility of this practice will appear upon a slight examination of the subject. Disease consists not only in increased, but disordered action. This action is not only exhibited in the increased celerity of the circulation, but this increased momentum of the blood, serves to produce still further disturbance in the action of the organic systems. By removing a portion of this fluid, we not only withdraw the means by which the impetus is afforded, but we abstract so much of a stimulating principle by which action is kept up. It is therefore properly preliminary of cure, or so prepare the way, that healthy action may be restored by other means. "The time when it should be employed with this view, is obviously of importance. If practised within six hours from the invasion, and before the disease has attained its acme—if conducted with the energy necessary to give effect to the purpose—the disease is either arrested, or is so much crippled in its progress that it readily yields to the means so commonly resorted to, to restore the healthy train of actions. If practised later, its effects are less decisive, but still salutary: it is not to be depended upon, but it is not prohibited, and it is occasionally useful even at still later periods."—*Jackson*.

The *Palliative* or *Auxiliary* operation becomes necessary, when the curative cannot be pursued. This practice, which is most frequently followed, is not without its advantages, and is particularly useful in conducting the disease to a safe issue. When employed before organic derangements have taken place, it is frequently more decidedly remedial, and more certainly beneficial, provided the powers of the system can sustain the operation, than any other single means we can employ. It is of this treatment I shall enlarge upon more particularly, and which I shall chiefly keep in view in the present lecture. It is the least hazardous for those setting out in their career of practice, and until long experience has accustomed them to the various grades of action, to be familiar with the phases of disease, and the capacity of the system to sustain strong and powerful impressions, the practice which I would recommend. It is time, however, to enter upon the details of its employment to diseases.

#### OF ITS UTILITY IN YELLOW FEVER.

In this disease, the opinions delivered are more contradictory than could be desired; but since unanimity cannot be obtained upon this, or any other subject, I shall consider the evidence of men who have been most distinguished in our profession. By Dr. Rush, and other physicians of Philadelphia, it was employed in conjunction with purging with very considerable success in the Yellow Fever of Philadelphia, in 1793. Its effects were beneficial in the highest degree, and he has described at length the obvious advantages which resulted from it. These were, a reduction of the force and frequency of the pulse, checking in many cases the vomiting which occurred in the beginning of disease, and lessening the difficulty of opening the bowels. It removed delirium, coma, and obstinate wakefulness—lessened muscular debility, and eased pain. In particular it is stated, that when used early on the first day, it frequently strangled the disease in its birth, and generally rendered it more light, and the convalescence more speedy and perfect. It should not, however, be indiscriminately employed, but judgment and care be exercised, and the practice pursued only in the early stages. It is probably owing to inattention to the stages, that the contradictory accounts upon this subject have originated, since it is obvious, that the earlier it is employed in a disease which runs through its course with so much violence and rapidity, the more beneficial will be its effects. Dr. Jackson speaks of its great utility under these circumstances. Drs. Moseley and Pinckard are equally favorable to this practice when similarly pursued.

As far as I can judge of the utility of bleeding in this disease, it would appear, that when the sick were visited early after its ac-

cession, that when the subjects were of a robust habit, such as in the case with foreigners previous to their being climatized—that bloodletting was undoubtedly of considerable utility. Under these circumstances, it diminished the turgescence of the blood vessels, moderated the action of the heart and arteries, controlled the unequal distribution of the blood in the several parts of the body, and, by lessening the excitement of the brain, tended strongly to the relief of its sympthetic derangements—as gastric uneasiness, muscular pains, with the distressing restlessness, and jactitation of the patient. In some instances, a speedy crisis of the paroxysm ensued, and in all great relief was afforded. Carried to the extent of producing faintness, by suddenly diminishing the excitability of the system, the various secretions were renewed, and the patient has fallen into a tranquil and refreshing sleep. It is not to be supposed that a cure is to be effected by this means only, but along with it, depletion by the bowels, and the full exercise of the antiphlogistic treatment.

The quantity of blood to be drawn in this, and other diseases, with the frequency of the repetition, will depend upon a variety of circumstances and the judgment of the practitioner. It will be connected with the temperature of the weather, the strength of the predisposing causes, the constitution of the patient, and other considerations which can better be determined by an inspection of the case, than by a description. In this and nearly all acute diseases, it should be carried to the extent of producing a positive impression—as it is only from the cerebral and nervous energies being reduced, that beneficial effects can result. When the remedy is employed to this extent, it will be found productive of more decided advantages, than any other evacuation.

Where the state of excitement forbids the employment of venæsection, its topical abstraction is highly to be recommended. Of the consequences of fever, none are more striking than the unequal distribution of the fluids, with the state of oppression of particular organs. The brain and nervous system, are particularly and violently affected in this disease, and doubtless many of the symptoms which are exhibited in the progress of the complaint, have their origin, in the strong and unequal conflict which this organ sustains. Lessening these determinations by cupping, or what is preferable, by opening the temporal artery, and allowing a free evacuation of blood, the action of disorganization is arrested, and great and effectual relief is afforded. I have on several occasions where general depletion by the lancet has been inadmissible, had recourse to this local detraction of blood, and always with the happiest effects. In dismissing this subject, I shall repeat that it is to the earlier stages of the disease that it is best adapted, though circumstances may occur in its progress which will ren-



der it useful. The time, I repeat, when bleeding is performed in this and other diseases, is obviously of the utmost importance.—The physician, in the first stage of fever, armed with his lancet, is, in the language of S. Smith, to his patient what the fireman with his engine, before the flames have had time to kindle, is to a building that has taken fire. At this early stage, the former can check inflammation with almost as much ease, and certainty, as the latter can prevent the flames from bursting out. While the physician, who is called to treat inflammation in the latter stage of fever, is in the position of a man, who arrives with the apparatus for saving the house, when its stories have been already consumed, and its roof has fallen in.

As may be supposed, in the Simple Continued, Intermitting and Remitting forms of fever, bleeding is often required; and in the latter particularly it may be found necessary to begin with opening a vein, and to repeat the bleeding, according to the urgency of the symptoms. The operation may be performed during the remission, though it is better in the height of a paroxysm, and the remission is observed to come on sooner and be more complete. The earlier, too, in the disease it is performed, the better, as by a prompt and efficient use of the remedy, the progress of the disease may be arrested, and this with greater probability of success, as the disordered condition of the vascular system has existed but for a short time. The pulse should be observed sensibly to yield to the evacuation, the blood being allowed to flow until it becomes feeble, small, and a disposition to faint, or actual fainting, be produced. By this method of proceeding, its open character is subdued, and with it the constitutional affections—or its concealed dispositions made manifest, and thus readily point out the means to be pursued. When bleeding is delayed to a more advanced period, more caution should be observed, for though the morbid actions may be reduced, the powers of the system may be so prostrated that reaction will become impracticable, and the remedy, from being ill-timed, become more destructive than the disease.

In Remittent Fevers, complicated with determinations to the Hepatic system, the remarks which have been made upon Bleeding in fevers generally, are particularly applicable.

This is a very common form of fever, in the low and marshy districts of our country, and is familiarly known by the name of Country Fever. In these cases, I believe that the use of the lancet in the beginning of the disease is of the utmost importance;—not only its early, but sometimes its free use during the disease. By an early recourse to it, the severity of the paroxysm is much mitigated, and if carried to the extent of reducing the pulse, or disposing to syncope, a copious secretion from the surface is produced, with great and essential relief to the symptoms.

By it we obtain relief of many symptoms, as headache, irritable stomach, restlessness, pains in various parts. By it the action of cathartic or other medicines is promoted, and by it also those determinations, and organic derangements prevented, which so often render the cure imperfect, rendering the life of the patient a continued struggle to produce health, or obviate disease.

The effects of bloodletting, I would wish to observe in this disease, (for it may be the only opportunity I shall have to offer my views of treatment,) are very powerfully supported by the affusion of cold water. The adoption of this practice serves as a substitute for continued bleedings, without its exhausting effects. A proper employment of it reduces the pulse 10 or 20 pulsations in the minute, lowers excitement of the skin, relieves pain, and counteracts determinations to particular organs. It removes delirium, tranquilizes the patient, induces sleep, and promotes many of the secretions, particularly of the skin. A single effusion is, however, not sufficient, but it must be continued every two hours, or oftener as the excitement demands. Thus pursued, I have had a patient immersed six or eight times during the day, and with the most delightful effects. In short, my directions are, to place a large bathing tub in the room, and require of the attendants to place the sick person in the bath whenever the excitement rises; whenever he complains of heat, restlessness, confusion in the head; whenever there is muttering or other symptoms.

Manner of using the cold effusion described.—With these means, evacuants of a mild character are to be employed; they are generally saline, combined with an infusion of *Serpentaria* or *Senna*, and so administered that six or eight evacuations are obtained in the twenty-four hours. By these simple remedies, continued perseveringly, the utmost relief is afforded, the progress of the disease greatly mitigated, convalescence is proportionably rapid, and since its adoption I have not to my recollection lost a single patient with country fever, as it is called.

Medicines administered at intervals of two or three hours, are not sufficiently prompt to contend with the disease. Strong impressions are required, to prevent those derangements of particular organs from taking place, which result in congestions, and particularly those congestions of the brain, which are so often exhibited in the concluding stages, and which when established, all the stimulants which can be applied, are insufficient to overcome. Hence the patient sinks, not because the stimulants are not sufficiently powerful, but because the brain has sustained such lesions from previous excitement, that its energies cannot be renewed. It is to prevent these derangements, in the early part of the disease, that the practice I have recommended should be directed.

It is, however, in Inflammatory diseases and affections, properly so called, that the great superiority of this remedy is manifested. Here the blood vessels chiefly are disordered, and the evacuation is made directly from them. The impression, therefore, can be more instantaneous, and its action extended at once to the seat of the affection. In these cases it will be obvious, that the earlier it is employed, the better, especially in affections of the chest and abdomen, where from the great vascularity of the parts, the progress of the inflammatory action is extremely rapid, and the injury done to organs so essential to life often becomes irreparable. Here, then, the importance of attention to time is apparent, and it illustrates the propriety of this direction in the former diseases. But this is not the only direction which should be held in remembrance—the quantity which is drawn, and the suddenness with which it is effected, are highly important. According as these are attended to, will be the strength of the impression made.—The quantity to be drawn will depend upon the state of the pulse, the degree and seat of the inflammation,—the age, habit, and constitution of the patient; but the effect may always be increased by drawing blood from a large orifice, by abstracting a large quantity at the beginning, and continuing it until the pulse is reduced, or a disposition to fainting brought on. By pursuing these directions, it has been observed that less blood was expended, than according to the usual method pursued of removing 10 or 15 ounces at a time—because (as Armstrong observes) one, two, or at most three, bleedings answered, whereas under the other mode, the operation has frequently to be repeated four or five times.

By pursuing these directions, the temporary weakness is greater, but the patient gradually recovers, and his strength is restored to a certain degree. It is, therefore, best adapted to our views of fever, which are to reduce the present strong action of the arteries, without occasioning permanent weakness. We may obtain a positive effect, *i. e.* faintness and general relaxation, without exhausting the powers of life, by drawing blood while the patient is in an upright position; and this practice may very properly be pursued with delicate constitutions labouring under high arterial excitement, or in cases where it is desirable to secure the consequences of free depletion without its exhausting operation. Let it, however, be distinctly understood, that in practising bloodletting, the effect to be obtained, or the impression made upon the system, is to be the measure of what is drawn, rather than the apparent quantity. This rule is enforced by the authority of Dr. Armstrong, and it is one which cannot too strongly be urged upon you. It will curtail the progress of inflammatory affections, and in most cases bring them to a speedy crisis. As there are few



cases which will withstand two or three operations carried to the extent of producing faintness or fainting. It will save pain to your patient, and result in much satisfaction to yourselves.

It may not be amiss to state some of the quantities which, during the existence of morbid excitement, the system will support without any ill effects being experienced. I witnessed a case of fever in the summer of 1824, in which 4 pounds were drawn at once. Mr. Cline drew 320 ounces in twenty days from a patient in St. Thomas' Hospital, London, who laboured under a contusion of the head. Haller, in his *Elements of Physiology*, has recorded instances of loss of blood which would appear incredible. From all that we can observe, it would seem that the system accommodates itself readily to the abstraction of blood, and that it is quickly regenerated.—Vide *Rush's Defence*.

It may be useful to bring before you some of the more common Inflammatory affections, in which the utility of bloodletting is manifested. In Pneumonia and Pleurisy, it is the remedy chiefly to be depended upon, freely and early employed. The directions which have been given should be fully attended to, and the quantity drawn be regulated by the degree of inflammation present, and the vigour of the constitution. In this disease, it is particularly proper to continue the flow of blood until a remission of the pain takes place, or until a disposition to syncope is induced.—We are not to stop the bleeding until one or other of these effects are produced. It will often happen, that with a reaction of the heart a renewal of the pain takes place. This is no proof that the remedy has been improperly used; but on the contrary, a reason for repeating the operation, which in many cases may be done in a few hours, or on the same day. It will be particularly required, if syncope comes on from constitutional peculiarities, and before sufficient depletion has taken place. Under these circumstances, a repetition of the operation will be better borne. The period during which the disease has existed will form no objection to the practice recommended; though it must be obvious, that it will be better borne, and the effects be more beneficial, according as it is done at an early period. But it may be practised at any time, only more caution is required, and a due consideration of all the circumstances connected with constitution, age, &c. When general bleeding has been pushed to a proper extent, without being beneficial, the local abstraction of blood, as will be mentioned, may properly be resorted to.

In Dysentery, the utility of bloodletting is often very conspicuous. It is not to be understood that every case of this disease will require the practice here recommended, for it will often subside under very opposite practice. But when there is much inflammatory action, as evinced by an excited state of the arterial system,

augmented heat, pain and soreness of the abdomen, with severe bearing down efforts, bleeding will be found of the utmost service, and this not only from the relief it affords, but by causing the system to be more readily acted upon by purgative medicines, shortening the disease, and lessening greatly its tendency to become chronic.

Of the utility of this practice, there is not wanting the authority of names in its support. Sydenham was a great advocate for bleeding in this disease, and Sir John Pringle, frequently employed it in the dysenteries which appeared in the armies to which he was attached. It is not, however, the only means to be pursued, but a combined system of action must be adopted, in which, without availing ourselves of any one remedy, the conjoint agency of others may be brought to our assistance. Premising, therefore, our management of acute cases of dysentery with bloodletting, we shall find its effects greatly supported by Cathartics, Opiates, Calomel, &c.

In Phrenitis, arising from local injury of the brain, or unconnected with fever of any peculiar type, the advantages of bloodletting or rather its superiority to all other means, are very conspicuous. Purgatives, and even nauseating doses of emetic substances, are very important auxiliaries, but bloodletting has a more decided control over the symptoms than any other measures. In this disease, Vs. is therefore indispensable, and it is not unusual to observe every exacerbation in the progress of such a case, denoted by increased restlessness or delirium, together with an increased frequency of the pulse, of perhaps ten, fifteen. or twenty pulsations in a minute, regularly subside after the loss of even six or eight ounces.

In Ophthalmia, the great importance of this species of depletion must be particularly obvious, as well as the necessity for early and decisive measures.

The nature of this last disease furnishes me we with an opportunity of pointing out and illustrating the utility of Vs. upon a very important system of vessels,—the Capillaries. No one can doubt the very important part these vessels perform in inflammatory diseases—constituting the seat of inflammation. It must be obvious, that there is no course more effectual to take off the impetus of blood sent by these vessels to the head, to relieve vascular tension, and to deplete immediately from the diseased part, than the remedy of which I am speaking.

The supply of blood sent to these vessels being diminished, as well as its impetus, these vessels, by their powers of contraction, are enabled to empty themselves by their own force, and by the same power to resist the return of an excessive load. In Ophthalmia we have exhibited to our view the action which takes

place in other parts while in a state of inflammation. The very minute vessels become enlarged and distended with blood, and to their excessive action the train of consequences which succeed are to be attributed. In this disease, or Ophthalmia, I have seen more benefit from a few ounces of blood taken suddenly, and a tendency to syncope brought on, in its removal, than by an active course of cathartics of two days continuance. In short, an inflamed eye, which is red as scarlet before bleeding, in a few minutes is essentially improved in its appearance, and a repetition of the remedy will frequently remove it. From what has been said, the same remark will hold good in other inflammatory cases.

There is yet one other form of fever in which the good effects of bloodletting are frequently manifested—the Puerperal state of fever. Different views have been maintained respecting the pathological character of this complaint, and much contrariety of practice has resulted. From an attentive consideration of the symptoms and appearances upon dissection, little doubt can exist but that it is decidedly inflammatory. The pain, tenderness, fullness of the abdomen, the quick pulse, preternatural heat, headache, thirst and vomiting, with the post mortem examinations, strongly evince an active and malignant state of inflammation, extending with great rapidity from one order of parts to another. Under these circumstances, the treatment to be pursued consists in the exercise of the antiphlogistic remedies, and bloodletting is of indispensable utility. It should be drawn early, and freely, and the testimony of many distinguished practitioners is decidedly favorable to its utility. Such, however, is the rapidity of the inflammatory action, and such the malignancy of its course, that it is considered unsafe to resort to this evacuation after the disease has been established thirty hours. The insidious nature of inflammation is in no disease better exemplified than the present. It is often obscure in its beginning, insidious in its progress, and rapid in its termination; hence, it is apparent how necessary is a prompt recourse to bloodletting on the very first accession of the disease. For in many instances the continuance of increased vascular action for a very short time, places the patient beyond the reach of our remedies. A hesitating or undecided practitioner, who takes a few hours only to make up his mind respecting the course he is to pursue, may often thus doom his patient to an irretrievable fate. The importance, therefore, of a thorough consideration of all the circumstances which should lead to so important an operation as bloodletting, cannot too strongly be enforced upon you; and this more especially, as there is a tact which cannot be inculcated by any rules, and is often, only to be acquired by actual practice and attentive observation.



In thus considering the importance of bloodletting, as a remedy in the several forms of fever, I would not be understood to recommend it to the exclusion of other active remedies. Purgatives are excellent auxiliary means, and are of the greatest service in correcting the deranged state of the intestinal canal, which proves a source of irritation and keeps up the morbid actions.—They often fulfil indications which bloodletting cannot, and are, therefore, not to be overlooked. I have wished to call your attention to the present remedy, which is probably too often neglected, and have endeavored through the whole of these remarks, to enforce its importance, its promptness, and its power in subduing morbid action.

Objections have been urged against the lancet upon which it may not be improper to make a few general remarks. It has been urged against the practice, that Dropsies and Anasarcous Swellings are frequent consequences of its employment, and the dread of the disease has often operated greatly to the disadvantage of the patient. When these effusions succeed the attack of acute diseases, I am more disposed to think that they have oftener followed as the consequences of those diseases, for which it was necessary to bleed, than as the effects of the remedies employed. They arise, as Dr. Rush observes, in most cases, from the want of sufficient bleeding in inflammatory diseases. And again, if ever bleeding kills, says Botallus, it is not from its excess, but because it is not drawn in sufficient quantity, or at a proper time. I repeat, therefore, that where these effusions arise, they rather proceed from our ill-directed efforts at treatment, and from the diseased action being allowed to exhaust itself. Those means which are best calculated to subdue this action, are the best adapted to prevent and cure such dropsical affections. In this manner we may account for the success attending the employment of bloodletting in those dropsies, resulting from the application of cold, or from other causes, when an inflammatory disposition exists.

Bloodletting has been objected to in fevers, as tending to increase the debility which exists. Every practitioner must be aware, that in cases of high arterial excitement, the great apparent weakness arises from the oppression of the system from an overloaded state of the circulating vessels. (Whether or not the depression which exists proceeds from the pressure of the blood upon the nervous fibrillæ which are in contact throughout the whole system with the vascular ramifications, and which pressure is occasioned by the increased action of the heart and consequent increased impetus of the blood—still the fact is evident.) Bloodletting, by relieving this state of the vessels, tends greatly to revive the strength and energies of the body, and this effect

must have been frequently noticed. Cases no doubt exist, in which the powers of life are so much exhausted, that a single evacuation by the lancet would terminate fatally—but these cases can never be confounded with those described.

It has also been objected, that the practice of bloodletting renders its habitual employment necessary. For the refutation of this and other objections to the practice, I refer you to Dr. Rush's *Defence of Bloodletting*.

The utility of bloodletting might be further illustrated by the recital of various other diseases, in which it is so much resorted to, and its efficacy so well established. These cases will be fully detailed to you by the Professor of the Practice, with the states of the pulse, and the appearance of blood upon being drawn. My object has been to call your attention to this mode of depletion, which is the most powerful practised—to enforce its operation in a few instances, and the extent to which it should be carried to derive its beneficial effects in the fullest degree.

Before dismissing this subject, I shall briefly detail the immediate effects of this remedy on patients labouring under disease.

The first is, a reduction of the force and frequency of the pulse. The pulse is more sensibly affected by this means than any other that is practised; from being hard and frequent it becomes slow and soft. Of its influence in this respect many examples may be given, but I will only state, the pulse has been reduced from 112 pulsations in a minute to 64, and the effect so long continued, that at the expiration of twenty-four hours it did not exceed 84 pulsations. Its influence on the pulse in other respects, is equally remarkable—from being small it gradually expands after the operation, when slow it is quickened, when strong and hard, it becomes soft.

2. The sudden removal of delirium, is another effect which frequently succeeds this operation.

3. The relief of pain, is another remarkable consequence of Vs. It is often so immediate that patients, after having been harassed for a long time, have sunk into profound sleep soon after the arm has been tied up.

4. It reduces the temperature of the surface by lessening the excited state of the circulation, and by inducing such relaxation of the surface as causes perspiration speedily to break out. With this change, the respiration becomes less hurried, the countenance becomes more clear, calm, and intelligent, and the sense of thirst is greatly abated.

5. Bloodletting promotes the operation of cathartic medicines, in some instances so quickly, that the patients have demanded the close stool before the blood has ceased flowing. This effect of

Vs. has been often noticed, and it has been resorted to with this particular view, in many instances with great advantage.

The last effect I shall mention of the drawing of blood, is its tendency to induce sleep. The rest thus procured is often of the most grateful and refreshing nature, since it has not been obtained by such means as could harrass the patient with a train of morbid symptoms, but by reducing excitement, by lessening pain, and restoring the secretions to their usual state. The consequence is, he awakes refreshed, invigorated, and his healthy feelings in some degree restored.

Such are the more prominent effects of bloodletting. Without being an enthusiast, I would inquire, whether such results have not been witnessed by every practitioner? If such is the case, how important are the benefits conferred, and how much more speedily will morbid excitement be reduced by this means, than by the wear and tear, as it were, of the intermediate organs, which other modes of practice not unfrequently produce! Be cautious, and before having recourse to it, consider well all the symptoms and appearances presented to you, and you must be pleased with its effects.

REFERENCES.—*Poliniere Sur les Emissions Sanguines; Armstrong on Typhus Fever; Jackson on Fevers; Welch on Bloodletting.*



#### LOCAL BLOODLETTING.

UNDER this division will be comprehended Leeching and Cupping.

This method of drawing blood, I need not observe to you, is often attended with the happiest effects, and at the present time is very extensively employed in Europe, in the treatment of diseases. The researches of the French physicians, and the pathological opinions which have arisen from them, has caused this local detraction of blood, and particularly by leeches, to be held in the highest estimation, and from this circumstance, in connexion with the utility of the practice, your attention may be properly directed to them.

Of the Genus *Hirudo*, there are several species, the principal, or that used in medicine, is the *Hirudo Medicinalis*. It is characterised by an oblong body, very contractile, having each extremity capable of being expanded into a fleshy disc, by which it adheres to the body with a kind of suction, similar to a cupping glass. A triangular mouth situated under the anterior extremity, armed with three very sharp, strong teeth, and a sucker at the



bottom, by the assistance of which it draws blood from the wound it inflicts.

Leeches have for some time past been in use in the practice of physic, for evacuating the vessels of a part labouring under inflammation. Their employment, however, seems to be by no means so general, as their importance demands. This depends upon a variety of circumstances, chiefly the expense of obtaining them, in those situations where they are not to be had, or are of an inferior quality.

It would be an endless task to enumerate the variety of medical and surgical cases, in which leeches may be used with advantage. In all inflammatory affections they are frequently of considerable service, but it is as an auxiliary rather than primary remedy. In all acute cases, and particularly of important viscera, general bleeding should be used to break the force of the disease, and after sufficient reduction, local measures are resorted to, to prevent a further expenditure of the vital powers, and they act with peculiar advantage at this time on the part diseased.

In inflammations about the throat, in the abdomen, thorax, cranium, or in the limbs and superficial situations, the benefit derived from the application of leeches, can often be obtained by no other means. To particularize some of these examples—In Cynanche Trachealis, or Croup, the application of leeches will very properly precede the employment of blisters; and in Quinsy, when deglutition has been quite obstructed, and repeated venæsection has proved unavailing, they have been known to afford very great relief.

In inflammation of the pulmonary organs, local bloodletting is often employed with very great advantage, and leeches applied to the thorax may be considered as acting locally on the lungs.—The close sympathy uniting the thoracic viscera, with the skin, explains satisfactorily the effects of these local bleedings on the Parenchyma of the lungs. They exercise beneficial effects, not only by the depletion which follows, but also by revulsion, deriving the fluids from these parts by the excitement given to the Intercoastal and Superficial arteries.

In inflammation of the Trachea, and in that very common affection, Bronchitis, in conjunction with other means, they are often very advantageous. In the painful, irritating cough, which accompanies the latter affection, the frequent pulse, difficult expectoration, leeches applied above the superior part of the Sternum, in the pit formed by the intermediate space, between the Sterno-cleido Mastoidei muscles, will be found highly serviceable. In this place they act almost immediately on the inferior part of the Trachea.

When the Parenchyma of the lungs is affected, and when the Stethoscope indicates some degree of hepatization, they are often beneficial.

In inflammations of the abdominal viscera, leeches are much and very properly employed. When applied to the Epigastrium, in inflammations of the stomach, they operate in the most powerful and direct manner on that viscus, and in inflammation of the intestines in the vicinity of the part affected. The flow of blood from the punctures may always be increased by washing them with warm water, and if necessary by applying cupping glasses. The effects of their employment, might still be further increased by covering the part with fomentations, emollient poultices, &c. removing them as they become cold.

In diseases of the eyes, joints, and testis, as well as in inflamed hæmorrhoidal tumors, the relief which they speedily afford, is acknowledged by most practitioners.

In numerous instances of extravasation of blood under the skin, ecchymoses, contusions, &c., they are frequently applied with great benefit.

In all cases of local plethora, or congestion, short of inflammation, so commonly attendant upon organic affections, especially of the heart, or large vessels, they are also useful. These local congestions are most conspicuous about the head, threatening or producing apoplexy, and leeching becomes an important preventative check.

In infants of tender years, and persons who have a particular dread of bleeding, in cases where the practitioner is fearful of venturing on general bloodletting, leeches may often be tried with greater safety.

In phlegmonous inflammations of superficial parts, their utility is so obvious, that I need say nothing upon this subject; but in Erysipelatous inflammations, their value, though less known, is equally considerable. The practice is common in the French hospitals. In using them, it is most proper not to apply them immediately upon the inflamed surface, as the bites of these animals have, on many occasions, put on this species of inflammation; but they are directed to be placed upon a sound part, two or three inches from the diseased.

When the erysipelas spreads extensively, and penetrates deeply, the inconvenience alluded to should be considered slight compared to the gangrene, or sloughing which threaten the part, and the leeches in consequence must be applied directly over the inflamed membrane. When thus used they should be scattered over the surface.

Latterly the use of leeches has been extended from the external to the internal surfaces, and their employment in this manner has been attended with effects highly gratifying. To illustrate their application in the latter cases—it has been observed that in Ophthalmia, more benefit has been derived from a single leech,

or a couple, applied to the inflamed conjunctiva, where it covers the lower eyelid, than by dozen to the temples. So powerful is its operation, that a chronic inflammation of the eye which had continued five or six weeks, was immediately relieved, and by a second application of them, was in two or three days completely removed. The practice is perfectly safe, and according to the reports of Mr. Crampton, the most powerful we possess, of speedily reducing inflammation. Useful as it is, it is not to supersede the other active measures which are necessary in lessening increased action.

The manner of applying them to the conjunctiva. The patient should be placed with his back to the light, in order that the lower eyelid may be everted without exciting pain. A leech or two, rather below than above the middle size, should be allowed to fix upon that part of the inflamed membrane, which covers the Tarsus, taking care that it fastens neither upon the ciliary margin, nor upon the eye itself. The leech fixes and fills itself in this situation, much more quickly than upon a cuticular surface, and this observation is equally true with respect to all internal surfaces, for which it is observed they have the strongest appetency.

Leeches have also been applied to inflamed Tonsils. A single thread of silk is passed through the body of the leech, at about its lower third—the ligature being made fast to the finger of the operator, it is introduced into the mouth, and its head directed by a probe, is brought into contact with the inflamed tonsil. The animal fixes itself to the part in an instant, and in less than five minutes being gorged with blood, falls upon the tongue and is withdrawn. Relief soon follows, and the part continuing to bleed for three or four hours, the inflammation is greatly reduced.

Leeches are also applied to the internal surface of the nostrils, in affections of the head, connected with undue determination of the blood to the brain, or with the suppression of an habitual epistaxis.

These remarks comprise the practical application of this article. Something may be said of the manner of *using* them.

The part to which they are to be applied, should be first washed with soap and water, so as to remove the matter of perspiration, and the skin should be wiped dry. The leeches are to be placed on with the fingers, either one by one, or all of them together, by being placed in a tumbler, covered all over except one edge with a piece of linen, and applied close on the spot to be bled. As they will not stick to the glass, or the linen, they are in some measure forced to attach themselves as the surgeon wishes. The leeches should generally be suffered to fall off the spot spontaneously. If forcibly separated, the teeth which penetrate the skin, and which swell when inserted, are apt to be torn off, and when



this happens the wound is very likely to inflame, and the animal is rendered useless.

When the patient's weakness, or any other circumstance requires them to be speedily removed, they may easily be made to drop off, by sprinkling them with a little salt or snuff. Such as fall off spontaneously may be used a second time, for they remain possessed of their teeth, and to prevent them suffering from their engorgement, they should be put into a weak solution of salt and water, which causes them to discharge the blood. Such as are carefully attended to, may be used five or six times.

The number to be applied, will vary with the exigency of the case, and the age of the subject. For an infant of very tender age, from three to six—as years advance the number may be increased to thirty, forty, or sixty.

The quantity of blood drawn by each leech, will depend upon the quality. A single French leech, it is said, will draw half an ounce of blood. Ours do not take so much, but the bleeding from the punctures is often very considerable. The majority of American leeches take from two to three drachms each, which is the quantity calculated upon in a prescription for their employment.

REFERENCES.—*Johnson on the Leech* ; *Poliniere Sur les Emissions Sanguines*.

#### CUPPING

Is another method practised, for abstracting blood from a part, and is resorted to when to the loss of blood it is also desirable to excite much irritation on the the skin. For this purpose it is better adapted than leeches, and therefore it can only be employed where the skin is sound, or be applied to parts distant from the diseased. It is to this power of deriving the fluids to the surface, which cupping possesses in a high degree, that we must ascribe its superiority in many cases over leeching, while it is obvious, that in other instances this last has advantages which are almost peculiar. In local inflammatory affections, inasmuch as blood drawn immediately from the part, will afford most relief, leeches are decidedly preferable. In deep seated affections, over which the skin is sound, it has been considered a matter of indifference by what means blood was drawn from the part, though from what I have said, a preference should be given to cupping. At present, leeching is the method of abstracting blood to which physicians are most partial, and as it is less painful, and more blood can be drawn by them with convenience, they may maintain their rank ; but cupping is a good substitute, and a very valuable agent.

The diseases to which this remedy is adapted, will correspond with those which have been already mentioned under the head of leeching. They may, however, be enumerated, and are as follows:—headache, delirium, phrenitis, the various grades of madness, vertigo, in all tendencies to apoplexy,—in inflammation of the eyes, and inflammatory affections of the chest,—in asthma, dyspnœa from various causes, &c. Cups are applied to the temples, to the scalp, the back of the neck, along the spine, to the chest, and in various other situations. The operation is very simple, but to acquire dexterity much practice is required.

It is performed in the following manner:—the skin being softened by means of a sponge and warm water, a small bell-shaped glass vessel, or other material, having the air previously exhausted, by being held over the flame of a lamp, or by burning it in tow, or paper, is immediately applied to the part. The edge of the cup must be accurately adapted to the skin, and no substance, as hair, should be interposed, otherwise the external air will fill up the vacuum and the cup will not adhere. The adhesion of the cup to the skin, or in common language the suction, which takes place, depends upon the pressure of the air upon the surface of the exhausted cup, and from the absence of the same pressure upon the skin—it swells, and rises in the cup, the vessels are enlarged, and become very red and turgid. When this state has continued a few minutes, the cup is removed and the sacrificator is applied,—the depth of the lancets being regulated by the vascularity of the part, and the quantity of blood desired. When a sufficient quantity of blood has collected in the cup, it is removed by gently introducing the nail of the fore finger under the edge, by which means the air is allowed to rush in, and the equilibrium being restored, the vessel falls off. The skin and the edges of the wounds being washed of the blood, and the coagula which have formed, the cup is again attached by the same means, and then removed, until a sufficient quantity has been drawn. When the operation is completed, the wounds made by the sacrificator are anointed with a little sweet oil or simple cerate.

When a cupping glass is applied alone without scarifying the part, the operation is called *dry cupping*, and is employed to produce speedy irritation on the skin for the relief of oppression, shortness of breathing, or pains about the thorax, and abdomen, &c. Cups may be made of tin or copper. Small tumblers may also be employed for the same purpose.

Lately Dr. Barry has recommended the application of cupping glasses to poisoned wounds, with a view of preventing the absorption of the venomous matter. The experiments which were performed to illustrate their utility, were as follows:—Wounds were made upon the back and thighs of full grown rabbits, and

when the blood had ceased to flow, two or three grs. of Strychnia, in powder, or ii. or iii. drops of Hydrocyanic Acid were introduced into the wounds: then, after intervals of three, five, and ten minutes, a cupping glass was applied to the wound, which was renewed as often as it fell off. No symptoms of poisoning occurred in these animals; but if on the contrary, this precaution was not taken, they all died. On one occasion Dr. Barry waited on until the animal became affected with convulsions, nevertheless he succeeded in saving it by these experiments,

M. Lannec has repeated these experiments, and has verified their results. Six drops of Hydrocyanic Acid were poured into a little wound made in the thigh of a rabbit—the cupping glass was applied for twelve minutes, and the animal showed no signs of having been poisoned; but when it was taken away, convulsions came on so suddenly that it was thought to be dead—but a fresh application of the glasses restored it to its former state of tranquility. The same effects ensued upon removing it again, and it was only half an hour after the introduction of the poison it could be removed with impunity. Another rabbit, treated with the same quantity of acid, died in two minutes.

Other deadly poisons, as Arsenic, the Upas Tiente, etc., have been employed in the same manner, and when the glasses were applied no poisonous symptoms appeared, but were soon produced if they were not.

Dr. Barry in studying the phenomena of the venous circulation, was astonished that the pressure of the atmosphere, was either left out, in the enumeration of its causes, or considered merely as a secondary agent. Atmospheric pressure he believes necessary. Absorption he does not look upon as a vital function, but as a physical effect dependent on the same cause, as the venous circulation, *i. e.* atmospheric pressure. Hence he concluded, that as the circulation and absorption are dependent upon atmospheric pressure, if this could be removed as by forming a vacuum, absorption would be prevented. Hence the various experiments instituted with this view, and in performing them the most deadly poisons were employed. The results were in many instances surprising, the action of the articles upon the system being suspended or excited, by the application or removal of the cupping glasses.

The experiments of Dr. Barry have been repeated by Drs. B. Pennock and Rodrigue, and his statements fully confirmed. They differ from him, however, in the explanation given of their mode of operation, and attribute to pressure only the good effects derived from their application. They tried pressure simply, without exhausting the air of the glasses, and found the same results to take place. They attribute, the good effects



which follow the use of the glasses to pressure, which acts by interrupting the action of the absorbents, and paralysing the nerves.

NOTE —The treatment I would pursue in bites of venomous reptiles, is, the application of a ligature above the affected part, and the employment of suction by the mouth. This method I would recommend in cases of poisoning, or suspected poisoning from animals, as more prompt, more effectual, and, I think, perfectly safe. Inasmuch as it can speedily be practised, it is superior to excision or caustic. If there are no ulcers in the mouth no apprehension need be entertained, for should a portion of the saliva impregnated with the poisonous matter be swallowed, no injury would result, since from the experiments of Orfila, the poison of the Viper may be introduced into the stomach with perfect safety.



### MATERIA MEDICA.

THE Materia Medica is commonly considered as divided into Aliments and Medicines.

This division, though not always followed by systematic writers, is certainly correct, and may be made productive of much practical utility. The subject of Aliments has been overlooked by Dr. Chapman, and some reflections made, calculated to place this division not in the most favorable or important point of view. In this respect I differ very essentially from such respectable authority, having always considered a well directed diet, one of the most important adjuvants to medicine, and in some cases, indispensable for a full restoration of health. For though you need not be informed of the solid qualities of beef and mutton, of the delicacy of poultry, or the flavour of game, and so on, yet you should all be acquainted with the kind of diet, which will suit different disorders, and more particularly, how to direct the regimen of your patients in such a manner, as to show yourselves not unmindful of their comfort, and of the very essential aid, which is to be furnished to your medical treatment from this source. For these reasons I shall devote several lectures to the subject of Aliments, and though it is usual to commence with their consideration, I shall defer it to the conclusion of the course.

### OF THE MATERIA MEDICA PROPRIA.

By this term is meant, as I have observed, that department of Medical science, which teaches the knowledge of remedies, or the substances employed in the cure of diseases. The subject diffuses itself very extensively. Under it is considered, the Natural and the Chemical History of the different articles, and the method of preparing them for use—the application of these articles to diseases, their doses, and the best modes of administering them.

Previous to the consideration of these points, it will be proper to treat of the Classification of so extensive, and multifarious a list of remedies as this branch comprises. The importance of a good arrangement, in facilitating the acquirement of knowledge, is too well known to require any comments in this place—a good system of science being like a fine building in architecture, where from the skill of the architect, the various rough and heterogeneous substances, which enter into its composition, are so ordered, each in its proper place, as to present to the eye, a uniform and harmonious whole—so in the *Materia Medica*, the confusion which would arise, from so large a number of articles being irregularly treated, yields at once to the simplicity, order, and ready comprehension afforded by a judicious Classification.

The great improvers in Medicine, as in other branches of Science, seem to have been desirous of associating together, things, which in their nature, appear to have an obvious connexion. No branch of Science, affords a more manifest foundation for associations, than that which treats of the different articles employed for the cure of diseases. To this probably it is owing, that the distribution of Medicines into classes, is at least as ancient as the first medical writings now extant, perhaps as the art of Medicine itself. From the prevailing passion for novelty, as well as from attempts at improvement, it might readily be imagined, that during a period so extensive as that in which Medicine has been practised, many different distributions would be formed, and of course a variety of general terms introduced for expressing them. That you may form some idea of the various distributions which have been made, and of the difficulties to be encountered on this subject, I shall bring before you, a few of the various methods which have been proposed.

The first in point of time, and simplicity, is the alphabetical arrangement.

From this however it is obvious, that we can derive no information, with regard to the specific virtues of various substances admitted into our catalogue of the *Materia Medica*.

Another mode of arrangement is founded on the class of bodies, or kingdoms, to which the different substances belong; and thus we obtain three general divisions, of Animal, Vegetable, and Mineral substances. This method of classification, is liable to the same objection as the former, as it is too general, indiscriminating, and un instructive.

Another method proposed, is that, to which we are led by an investigation of the sensible, and most obvious qualities of medicinal substances, and they were considered, as they are acid, or alkaline, acrid, astringent, aromatic, glutinous, unctuous, bitter, emetic, or cathartic. This mode is also too vague, and inappro-

priate, to admit of general application. For some substances have no discriminating, sensible qualities, others possess several so nearly similar, that it is difficult to refer them to one class, in preference to another : and others again, resemble one another in their sensible qualities, and yet are very different in their effects on the human frame.

Other arrangements have been made, founded upon the medicinal operation of the articles upon the system. This method must be considered the best for Classification, as well as to present to our view the predominant characters of such a variety of articles, as the *Materia Medica* comprises. It is evident, that medicines ought to furnish the characters, which serve to unite, or to separate them ; and what characters can be preferable to the effects, physiological, and practical, which they excite. It is the impression that a medicine makes upon the organised tissues,—it is the results which follow their application upon these parts, which must determine its place, in a methodical distribution of medicinal agents. In executing an arrangement founded upon this principle, however, various methods have been pursued.—While the outline has been admitted, the filling up has presented pictures as various as the persons who have been engaged. Dr. Cullen, in pursuing this plan, has arranged the articles as their operation is exerted upon the solids and fluids of the body, and has distributed the various substances into twenty-three classes. Dr. Darwin comprehends them all under seven classes. While Cullen's classification has been thought too diffuse, Dr. Darwin's is much too contracted, and adapted only to his own exceptional system of Pathology.

The arrangement into Classes, has within a few years been the order pursued by most writers on the *Materia Medica*. They have differed from each other, in the number of these classes, and a few distinctions of but little value. Of late it has been usual to arrange the articles of the *Materia Medica*, according to the Systems of the body, and to treat of them, as their action is exerted upon any of these systems.

The following arrangement will be pursued in these Lectures—

1. To speak of those medicines which irritate the Stomach and Duodenum—This division comprising Emetics.
2. Those which irritate the internal surface of the Intestines—This division comprising, Cathartics.
3. Those which increase the natural operations of the Intestines, without exciting irritation—Laxatives.
4. Those which destroy or counteract offending Substances, lodged in the Alimentary Canal—Anthelmintics—Antacids.
5. Medicines which promote particular Secretions—
- a. Of the Skin—Diaphoretics.



*b.* Of the Kidneys—Diuretics.

*c.* Of the Uterus—Emmenagogues.

*d.* Of the Salivary Glands—Sialagogues.

*e.* Of the Bronchial Passages—Expectorants.

6. Medicines which strengthen the organised Structures—Tonics.

7. Medicines which in strengthening also restrain excessive discharges—Astringents.

8. Medicines which lessen the energy of the nervous and muscular systems—Narcotics—Antispasmodics.

9. Medicines *Incertæ Sedis*, i. e. those whose action is not well determined, and which cannot with propriety, be arranged under any of the foregoing divisions.

In this proposed distribution, there are as many classes of medicines as are sufficiently determined by their characters, and by the phenomena which are proper to them. Each division represents a particular medical property, which is discoverable in all the natural substances comprehended under it. It is not to be understood, that this property is the same in all the different substances:—experience proves that each has not the same energy, but it is sufficient to justify the alliance which is made, that each exerts the same organic operations, and that the substances of each class, produce an action bearing a considerable resemblance to each other.

But though the plan proposed is as good as any, yet it is not without objections—the principal is, that some substances being possessed of various powers, their proper places are not easily ascertained, and they must necessarily be considered under different classes—instances of which may be given in Calomel. Tartarized Antimony, and others. The former acts as cathartic, sialagogue, alterative, and hence a repetition becomes unavoidable, and to render its history complete, it must be considered under each of these classes. Tartarized Antimony being emetic, cathartic, diaphoretic, and expectorant, according to the doses in which it is given, it becomes necessary to recur to it, when considering the separate medicines which are arranged under these several heads. But as there is no mode of classification, without some objections, I shall pursue this method as being least objectionable, observing that I shall treat of every article more particularly under that head in which its powers are most conspicuous, and that when from a difference in its preparation, or its exhibition, other properties are discovered, it must again be considered, under such other divisions, as correspond with the virtue specified.

It should be observed, that though I have made a classification of medicines, into Emetics, Cathartics, Diaphoretics, Emmena-

gogues, Tonics, &c., it is not meant to be understood, that the medicines of these classes, act in any of these modes uniformly and invariably. The contrary is too often the case. From causes to be referred to the states and conditions of the organs attacked, the same remedies exhibit often the most opposite effects—thus a Cathartic will often prove Emetic, and the reverse, a Febrifuge increase Fever, a Tonic will add to the existing debility—Antispasmodics aggravate the affections they were designed to remove.

It must be evident, therefore, that in this arrangement, nothing can be considered absolute; but that the operations of Medicines, will be modified by the condition of the organs or system, to which they are applied. In prescribing an article with a view to a determinate end, it is important that the condition of the part or system be as accurately known, as our present state of Pathology will admit—that the nature of the impression made by each medicine, as well as the force of that impression, be also known, with the modifications to be pursued, as relates to age, sex, idiosyncrasy, climate, season—that the preparation be such, as to furnish all the results that may reasonably be expected, after all the foregoing knowledge has been obtained; and lastly in what shape, or what states of combination, the medicinal agent produces the most powerful and beneficial effects. Upon some or all of these subjects, it will be my duty to enlarge; and as much as in my power, to afford you just, reasonable and proper views, upon the action of Medicines, so that without extolling them unduly, on the one hand, or depressing them unnecessarily on the other, present you such changes, either in the body to be acted upon, or the agent, as will secure, or defeat, the intentions we may have in view.

Pursuing the arrangement proposed, I shall consider under the first division.

#### DIVISION I.

##### *Medicines which irritate the Stomach and Duodenum.*

This comprises those articles termed Emetics.

In commencing any of the divisions, the following is an abstract of the leading objects which will be considered:

1. A definition of the class.
  2. The direct effects of the class, and the changes induced in the system by these direct effects.
  3. The effects of the class, in the cure of Diseases, and practical remarks upon its use in particular diseases.
  4. Directions to be observed in the use of the class.
- The history of the particular articles.

1. The Natural History

Under this head will be considered its Natural Family—sensible qualities—chemical analysis.

2. The Medical History.

The preparation of the article.

1. For a convenient form.

2. For preservation.

3. For external use.

Combinations of the article.

1. For augmenting its virtues.

2. For correcting its active powers.

Lastly—the Adulterations.

#### EMETICS.

By Emetic Medicines are understood substances which excite vomiting independent of any effect arising from the mere quantity of matter introduced into the Stomach, or of any nauseous taste, or smell, or of any acrid, or narcotic power—but by a specific impression upon the stomach itself. The importance of this class of Medicines must be known to all of you, exercising, as it does, an immediate control over the operations of so essential an organ as the Stomach. For as vigour of body, and a free exertion of the intellectual powers, depend upon the healthy state of its functions, so in disease its disordered secretions, or the morbid matters it contains, tend greatly to depress and enfeeble them. The beneficial tendency of this provision which evacuates the morbid contents of an organ, or changes its secretions, must be apparent. Emetics were therefore so much celebrated among the ancients, that Hippocrates even recommended them to the healthy, if they wished to remain so, and advised their frequent repetition.

Upon the employment of Emetic Medicines, several prejudices have commonly existed, which it would be proper to correct before I proceed further. It has been supposed by some, that vomiting was an unnatural operation, and one therefore which ought to be considered hurtful. Vomiting is an operation of the stomach, to which nature often has recourse to expel offensive matters—it may therefore be considered salutary, and one which may with propriety be imitated by art, with this great advantage, that bile or irritating substances lodged in the stomach, or duodenum, can with greater facility be evacuated in this manner, than through a convoluted tube of more than 30 feet in length. Accordingly it will be found, that the operation of a single Emetic, will evacuate more offensive matter from the stomach, with more certainty, as well as more immediate relief, than a course of mild medicines will do, of several days duration. Another objection to Emetics, is, that they are weakening remedies, and will exhaust the patient too much. This objection will also appear equally unfounded:



for the weakness which occurs in the early stages of disease, does not arise from real exhausted strength, but from the nervous system being depressed, in consequence of the action of morbid substances upon the stomach, and which is extended over the system. Any degree of languor, or weakness, produced by an Emetic, cannot be so mischievous, as suffering the morbid cause to continue in action. Whatever therefore will evacuate it from the system, so far from weakening, will restore strength, and this fact all of us must have experienced, either as relates to Emetics or Cathartics.

*The Immediate Effects of Emetics, and the Physiological phenomena following their employment.\**

An Emetic substance scarcely arrives in the Stomach, than it manifests its character. It irritates this organ; it excites an increase of vitality in the mucous membrane, the blood penetrates it, the capillary net-work existing upon its surface is more apparent, and the surface becomes more red and more sensible. These effects are extended to the duodenum, and the same organic phenomena excited. This increase of the vital energies of the Stomach is only of short duration. If the irritation caused by an Emetic, was of long continuance, it would cease to belong to those operations which are considered sanatory, it would partake of the action of disease. But the impression is soon effaced, without leaving any traces of its effects, within a very short time after they are administered. To these effects of an Emetic, others quickly succeed. It is important to particularize them.

1. The Serous exhalation, which in a natural state, moistens the interior of the Stomach, is soon increased to a considerable degree. The great increase of this secretion cannot be doubted, when we recollect the quantity of this fluid, which is often discharged by persons under the operation of an Emetic. Darwin relates the case of a man who had only drank a pint of fluid, and yet discharged by vomiting, six pints of this Serous substance.

2. The secretory action of the Mucous follicles of the Stomach is also increased a considerable degree. The thick, ropy, viscid matter which is rejected by vomiting, is the consequence of their great activity.

3. Emetics increase the secretory function of the liver, and the abundant discharge of bile is the consequence of their operation. It is impossible to believe, that the quantity of bile frequently ejected, could have existed in the Stomach, or duodenum, previous to the taking of the Emetic. The secretion of this fluid, is often excited by the medicine taken, and is the result of the exercise of its influence upon the animal economy. The irritation

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\* Vide Barbier, Traite Elementaire.

which the Emetic substance makes upon the surface of the duodenum, is extended by the ductus communis choledochus to the liver, it excites its vital operations, causes a flow of blood, to this organ, and in consequence an increased secretion. Particles of the Emetic substance, may also be absorbed by the branches of the vena portæ and carried to the liver, and add another irritant to this organ. It is probable too that the compression the abdominal viscera undergoes in vomiting, might by acting upon the gall bladder, promote a discharge of its contents, and thus increase the quantity evacuated. The fluid being poured in the duodenum, is by the action of this organ transferred to the Stomach, and from thence discharged by its contractile efforts.

It is easy to conceive, why bilious matter is not thrown up, when vomiting takes place, immediately after an Emetic is swallowed. The irritating operation of the article, has not been extended to the duodenum, neither has the liver been affected by the same action. But when the operation has not been prompt, biliary matter is always mixed with the contents of the Stomach.

The Pancreas partakes also of the irritating operation of Emetic articles, its secretory action is equally accelerated after their use. The action of the Emetic does not cease with these effects. The muscular coat of the Stomach and duodenum feels the influence of this new irritation. By its contraction the contents of this organ are expelled, and we have all seen how violent and severe it is in many cases, being so complete as to reject the smallest quantity of fluid which had been swallowed. Connected with this subject is the change which has taken place in the regular and accustomed operations of this coat. Instead of proceeding in its regular waving motion from the Cardia to the Pylorus, its action is completely inverted, and the contractions proceed from the Pylorus to the Cardia. Various attempts have been made to explain the inverted operation of this organ, but no satisfactory reason has been assigned, and will probably ever remain among the inexplicable operations of the system, which while operating for our benefit, their essential nature we are unable to explore. It is not always produced by the operation of irritating agents upon the Stomach, since it often occurs when the system is depressed and debilitated from local and general causes, as after syncope, or in injuries of the brain.

After the remarks I have made, little doubt would be entertained by you, that the evacuation of the Stomach was the result of an active operation of this organ. Magendie, the most distinguished physiologist of the present day, maintains that the Stomach is passive, and that vomiting is occasioned by the pressure of the abdominal muscles and diaphragm upon it. An opinion, so much at variance with the received impressions, excited

the attention of physiologists to an investigation of the particular actions, excited by an Emetic. The experiments of Magendie have been repeated by Mr. Harrison in his Gulstonian Lecture before the College of Physicians, and while the importance of the action of the diaphragm and abdominal muscles has been acknowledged, the contractions of the Stomach were also considered necessary to effect the expulsion of its contents. The impression which seems to prevail among the leading physiologists of the day, founded on a variety of experiments is, that in vomiting contractions of the Stomach do take place, but that for these contractions to be effectual, the resistance of the diaphragm and abdominal muscles is required, or something in its stead. The experiment has been made of giving an animal an Emetic, and dividing the abdominal muscles. It was then observed that while contractions took place, yet all the efforts of the organ were useless to eject its contents, until the hands were applied in the place of those muscles, when the Stomach being forced against the resistance made, vomiting was instantly accomplished. It is therefore decided, that the Stomach undergoes contractions, but to effect its evacuation, the aid of the diaphragm and abdominal muscles is required. Such would be our conclusion from the uniformity which takes place in this operation—the diaphragm becoming contracted and fixed, the ribs drawn down, the abdominal muscles drawn inwards, so that the Stomach is pressed on all sides by voluntary muscles, its own contraction is all that is required, and is what does take place to expel its contents.

The action of vomiting considered in a Physiological relation, is not what ought chiefly to interest us. It is the actions which it excites in various parts of the body—it is the changes which are produced in the exercise of its functions, which are important to be known. We need only recur to an individual under the operation of an Emetic, to be convinced that the influence which it exercises upon all the organs, is of a very powerful character. This leads me to consider

### *The General Effects of Emetics.*

#### 1. Upon the brain and nervous system.

The impression made upon the nerves of the Stomach, is soon extended to other parts of the system, to the brain, spinal marrow, sympathetic nerves and ganglions. To the excitement thus produced, are we to attribute the movements which take place in the other systems of the body, and the impression which is often made upon the morbid actions which exist.

#### 2. Upon the circulation.

The pulse under their influence is considerably and variously affected. Under the feelings of nausea it is more frequent and



smaller, with vomiting it is much augmented in volume, determinations take place to the brain to a considerable extent, as evinced by the redness of the face, swelling of the jugulars. The minute system of vessels, or the capillaries, have likewise their action increased and blood is sent to them to a large extent. To this state succeeds diminished action, languor in the intellectual and bodily functions, with a disposition to sleep.

The secretions are excited.

Expectoration is promoted—the contraction of the diaphragm and abdominal muscles with their alternate relaxation, variously agitates the motion of the air in the lungs and bronchia, and thereby promotes expectoration.

Emetics also act as Diaphoretics—there is a consent between the vessels of the Stomach and the surface of the body, so that several states of these are mutually communicated to each other. The action of an Emetic exciting nausea, with a copious effusion of the fluids of the Stomach, a relaxation of the vessels of the skin takes place, with an increase secretion from the surface.

Emetics increase the power of the Absorbents, as it is known that buboes in a state of suppuration, and other swellings, have been dispersed by their operation. This effect may be explained by the nausea excited reducing arterial action, and by a peculiarity of the absorbent system. Dr. Chapman observes, its functions are most active when the arterial is most depressed.

Emetics also act upon the Kidneys—but this may be considered an indirect result of their operation. For if the absorbents are excited to activity, there appears no difficulty in accounting for the action of the kidneys, for if water be absorbed, it must be discharged, and that through the kidneys.

#### *Rules to be observed in the administration of Emetics.*

In all diseases where much plethora is present, or when the habit tends to it, and where the condition of the patient requires at the same time an Emetic, blood-letting ought always to precede it, least the strong effort of vomiting should rupture the distended vessels of the head, and thus bring on apoplexy, or a discharge of blood, from other parts of the body be produced. In addition, vomiting seems of most use, which is excited immediately after bleeding, for the inconveniences of a plethora are then avoided, and the salutary effects of the Emetic are more certainly obtained, especially if the disease is a Fever, which requires the aid of both.

2. When the necessity is urgent, and a quick operation is desired, a large dose of the most active Emetic must be given.

3. In ordinary cases, it is best to give them in divided doses. Thus 4 or 5 grains of Tartarized Antimony may be dissolved in 4 or 5 table spoonful of water, of which a table spoonful may be

taken every 10 or 15 minutes until vomiting is excited. Then encourage it with tepid drinks, chamomile tea, &c.

4. If the operation of an Emetic is too violent, the best means of checking it is Laudanum in large doses, fomentations to the stomach, and sinapisms to the feet. If these fail, an anodyne enema and a blister to the stomach, or what would be preferable, a cataplasm continued as long as it could be borne. Sinapisms to the feet are very powerful in allaying the inordinate contractions of the Stomach.

In irritable conditions of the Stomach, whether brought on by Emetics or other causes, there is one direction which I wish particularly to impress upon you, viz: the absolute necessity of administering medicines and drinks in the smallest possible quantity. In this condition, the common people administer a variety of substances and to an unlimited extent. The thirst being urgent, drinks are freely taken, but from the irritable state of the Stomach, they are thrown up as freely. The best direction is to give as little as possible—a mouthful or table spoonful will be sufficient to moisten the mouth and throat, more will be rejected—sometimes entire abstinence is best.

5. Do not allow the apparently inactive state of the Stomach to induce you to augment the dose of an Emetic to a preposterous extent. Remember, as Dr. Paris observes, that although the Stomach may be unable to void its contents by vomiting, it may, nevertheless, retain its sensibility, and be therefore liable to inflammation. A case is related of a Practitioner attempting to excite Emesis in an epileptic patient, by a large dose of Sulphate of Zinc, produced inflammation of the Stomach, and a fatal termination. When the Stomach resists the action of one article carried to a reasonable extent, the best practice would be, to have recourse to another.

The great importance of this class of remedies, will excuse my entering a little into detail, in its application to diseases.

#### *Application of Emetics to Diseases.*

They are adapted to a great diversity of cases. When we consider the extensive surface which the Stomach and Intestinal Canal presents to the variety of irritating matters which are daily introduced into them, from the combined sources of extraneous articles of food, and the occasional morbidity of their natural secretions, it is no way surprising, that the primæ viæ are observed to be that part of the system, where we meet most frequently with those irritations, which produce, and keep up diseases. In addition to these sources of irritation, it happens from the affinity which subsists between the surface of the body and the Intestinal Canal, that when the general perspiration is checked by some ex-

ternal occasional cause, as by the application of cold, the natural secretions into the cavity of that Canal are increased, which secretions when allowed to remain there, so as become acrid, re-act again upon the system, and thus add to the general exciting causes.

It is in the various grades of Febrile action, that Emetics will often be found to exhibit their best effects. These diseases are always connected with symptoms, which mark a departure from the healthy condition of the *primæ viæ*—as impaired appetite for food, weight at the precordia, and abdominal distension; with nausea, thirst, and furred tongue. Here then we see the propriety of having early recourse to Emetic medicines, which by speedily evacuating the Stomach of its morbid contents, tend strongly to dissolve the paroxysm of fever. Accordingly, they should be of an active nature, such as while they evacuate freely, should make such an impression, as to dissolve any morbid associations which may have been formed, and which keep up and prolong disease.

They are not necessary in every case of fever. When the disease has been preceded by a meal, which oppresses the Stomach, they should be administered immediately. They should also be administered when nausea oppresses the patient, and when this is supposed to depend upon bile, or other irritating fluid—when there is an unpleasant taste in the mouth, and when the tongue is furred—when head-ache exists, and there is reason to believe that the general derangement of the system, proceeds from this source. Under these circumstances they may be administered with the greatest advantage. They are absolutely contra-indicated in Febrile diseases, when there is determination to the Stomach, and intestines. This determination is indicated, when the Stomach is irritable, with occasional vomiting of thin fluids, or frequent retching—when the tongue is red—when pain and soreness exist in the epigastric region, upon pressure being made.

In the Bilious Remitting, and Intermitting Fevers, of our country, they are often indicated, and may be had recourse to with the happiest effects.

In Intermitents, their operation is sometimes remarkable, not unfrequently putting a stop to the disease, without the employment of any other medicine. They have been recommended for the purpose, not only of cleansing the *primæ viæ*, but of preparing the Stomach for bark. Judging from my experience, I should speak favourably of the practice, as I have witnessed a more prompt operation of the bark after this preparatory process, than when it was not pursued.

Emetics are useful as Diaphoretics.



I have spoken of the utility of Emetics in Fevers as evacuants—but they are subservient to other valuable purposes. Among them may be mentioned the removal of the morbid stricture of the vessels of the skin, which may be considered as the principal accessary cause of uneasiness. Accompanying this morbid stricture, there is either an increased evolution, or a morbid retention of heat, which adds greatly to the irritation and excitement of the nervous and arterial systems. Emetics therefore not only by their impression upon the Stomach, but by determining the circulation to the extreme vessels, contribute very much to produce diaphoresis, and thereby is opened a channel, by which the superabundant heat is carried off.

In many of the deranged conditions of the Alimentary Canal, Emetics are extremely valuable. In Dysentery and Diarrhœa, they are very advantageously employed, for their Diaphoretic operation. With the skin, the Alimentary Canal possesses an intimate connection, and in most of the affections of the latter, the functions of the former will be found in a deranged condition. The skin is unquestionably the principal excretory organ of the body, and from the experiments of Sanctorius, much the larger portion of the ingesta, are carried off by this channel. Accordingly, when its secretory functions are oppressed, morbid action is excited in other parts, and disease ensues. Emetics then relieve the stomach and bowels, and by the excitement they produce, determine the fluids by a revulsive operation into other parts of the system, and particularly dispose to a renewal of the excretory functions of the skin. The utility of this practice is confirmed by Dr. Moseley and Sir John Pringle. Dr. Cleghorn was in the habit of giving the Pulv. Ipecac., in combination with Vitrum Antimonii Ceratum, in such doses as to empty the intestines as soon as possible. The cure may then be completed with small doses of any of the diaphoretics, as Ipecac. with Opium, Dover's Powder, Dieting, &c.

In Diarrhœa, the same remedies will also often prove serviceable.

In Dyspepsia, Emetics given occasionally, are productive of great benefit in the early stages of the disease. They should not, however, be repeated too often, as they would weaken and otherwise impair the tone of the Stomach. Their effect is to remove the acid contents of the primæ viæ, and to promote the intestinal secretions.

Emetics emulge the biliary ducts, and promote the biliary secretion.

In obstinate Constipation—The general practice in this disease has been, to have recourse to Mercury, until salivation is induced, after the usual evacuating medicines have been carried to a suffi-

cient extent, without success. This is most commonly successful and its good effects seem to depend upon its exciting the biliary secretion, by which the bowels are stimulated to a discharge of their contents. Emetics produce the same effects. They emulge the biliary ducts, and cause a more copious discharge of bile—while by their febrifuge and relaxing operation, they remove the Fever, the inflammation, and the constriction, which constitute the most dangerous as well as distressing symptoms that attend a constipated state of the bowels. Dr. Hosack relates several cases of persons subject to attacks of obstinate constipation, who could only be relieved by Mercury, carried to the point of salivation, after V. S. Cathartics, blisters, the warm bath, and enemata of Tobacco had been employed without success. Yet these persons in attacks, equally violent as those which required the above treatment, have been promptly and effectually cured by Emetics, which excited free and copious vomiting.

Emetics act as Expectorant and revulsive Remedies.

In most of the diseases of the Thorax, Emetics are highly recommended—particularly in some of the acute affections. In Pneumonia Notha, after the inflammatory action has been subdued, or when the congestive state of the lungs exists, in a high degree from the beginning, Emetics in repeated, but small doses, are more useful than any other remedies we can employ. Their utility in equalizing the circulation, is particularly obvious in this disease. Here the blood, driven as it were, from the smaller vessels, and from the surface, is accumulated in the larger vessels and in the lungs. To such a degree is this organ oppressed, by the degree of congestion, that Dr. Rush has termed the disease an apoplexy of the lungs. Emetics in such cases restore a more equal circulation, and with the discharge of much mucus, the patient experiences much relief.

In the Typhus Pneumonia, which pervaded so large a portion of our country, several years ago, and which deprived us of several ornaments of society, Emetics judiciously administered, were found very beneficial. It was, Dr. Potter observes, a novel spectacle to those who were accustomed to unsheath the lancet, in almost every thoracic affection, to behold a Pneumonic Fever removed by the incantation of a single Emetic.

In Asthma, given before the formation of the paroxysm, they very often suspend the attack. After the disease is formed, full and free vomiting, does much to effect the solution and bestow relief. From the extreme difficulty with which the blood passes through the pulmonary circulation, the large vessels in the neighborhood of the heart are tumified and enlarged, the extremities are cold, and shrivelled, the pulse is frequent, quick, and often small, a distressing cough is present, and an accumulation of mu-

cus takes place in the bronchia, which from its viscosity, and the inability to expand the lungs, cannot be expectorated. Under these circumstances, Emetics appear to exert a centrifugal power. The concussion the system undergoes by the action of vomiting, drives the blood into the remote parts of the body; by the nausea they produce, spasm is relaxed, and expectoration by the rapid passage of the air in the lungs, through the bronchia, is promoted.

In Pertussis or Hooping-cough, they are very effectual remedies, in the first stage. If the symptoms are violent, they should be repeated daily, and sometimes twice a day, at least in children, for older persons cannot bear the repetition so well. The antimonials are commonly preferred, but some employ the Vitriolum Album, upon the supposition that it is both Emetic and Antispasmodic. Dr. Fothergill recommends the antimonial preparations, and declares, that the practice of emptying the Stomach frequently, has been the means of affording most relief.

In Cynanche Trachealis, or Croup, Emetics are indispensable, and are equally successful in the inflammatory and spasmodic forms. Of the Emetics used, the Tartarized Antimony is to be preferred, from the certainty of its operation, and the permanency of its effects. With proper views of the Pathology of this complaint, we may approach it with as much confidence of success, as any other to which the infant state is subjected.\* In its commencement it is purely inflammatory, but accompanied with spasmodic affections of the Trachea. In mild cases they afford much relief to the symptoms, and they may be repeated during the whole course of the disease, whenever from increased excitement, or when from an increase of the secretion of the larynx and bronchia, any aggravation of the symptoms is experienced. In severe attacks, however, other measures become necessary, not only to arrest the morbid actions which are going on in the larynx and bronchia, but to render the system susceptible to the operation of these agents. The insusceptibility of the Stomach, to Emetics, is often exhibited in this disease, in a remarkable degree, insomuch that the largest doses of the most powerful, are often insufficient to occasion its evacuation. Blood-letting will be required, and it should be resorted to whenever the excitement calls for it, or whenever the Stomach cannot be roused by such doses of Emetic substances, as it is prudent to employ. The obstinacy of this organ, to be acted upon by these agents, is connected with the general excitement of the system; and if a single bleeding be insufficient to renew its susceptibility, another will, and it should even be carried ad deliquum animi. This will rarely be found to fail, and the effect of the remedies conjoined, is often salutary, in

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\* Chapman's MSS. Lectures.



the highest degree. We should not, however, discontinue our treatment with the evacuation of the Stomach, but large doses of Calomel will be required to operate upon the bowels. The cure will then be completed, by giving a decoction of the *Polygala Seneka*. "The neutrality, which in common practice, is followed between the patient and the disease, seems to depend upon incorrect notions of the pathology of complaint, and an idea that children cannot support such evacuations. The fact is children possess a remarkable tenacity for life, and they even appear capable of supporting bleeding, and other evacuations, better than adults. There is no doubt, that they have endured, what has destroyed persons more advanced in life—they have been found with their mothers buried under a hollow cone of snow, the latter dead, and the other still preserving life. They resist contagious diseases better than adults, they recover more readily from surgical operations, and when their systems have been reduced by evacuations of any kind—from these facts, we should consider the condition of no child absolutely hopeless."\*

In the various Anginose affections, Emetics are of great utility. They, in my opinion, are particularly well adapted to the commencement of these diseases, and in my practice. I have derived more benefit from their use, than from any other species of evacuants. These diseases, strange as it may appear, are often intimately connected with the disordered condition of the Stomach. This connection will not appear more singular, than various other diseases, which are admitted to have their origin in that organ—thus aphthæ in children, are referred to the state of the Stomach and Alimentary Canal. and various exanthematous disorders, have a similar origin. Emetics, then, are not only useful by evacuating the Stomach, but they reduce inflammation by the nausea they excite, and by the new determinations they produce.

In Cynanche Maligna, they are of use, in bringing off a considerable quantity of acrid matter, which by getting into the bowels, might induce a Diarrhœa—an affection to be avoided by every possible means, as always adding to the debility, and endangering the life of the patient.

In Cynanche Laryngæa, one of the most distressing forms of Anginose disease which you will ever witness, not only from the sufferings of the patient, but the great mortality which attends it, Emetics are often highly beneficial. Dr. Armstrong speaks of them in the highest terms, and states, that in five cases of this disease, he had exhibited the Tartarized Antimony, sometimes combined with *Ipecacuanha*, in repeated doses, until free and frequent vomiting took place. No circumstance of his professional

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\* Chapman's MSS. Lectures.

life, he says, ever gratified him more, than the great and sudden relief which the vomiting afforded—in reality it removed all the urgent symptoms at the time, and being excited as soon as the slightest signs of stricture of the larynx returned, at last completed the recovery.

Diseases in which most of the above effects of Emetics are combined.

Emetics in many of the diseases of the Head, have been thought beneficial. The connection which exists between the brain, and the condition of the Stomach, would render such practice, often judicious and safe. We know that there exists, a considerable sympathy, and that one responds with promptness, to the derangements of the other. The existence of pain, though severe to be borne, is a happy result, arising from our organization, since it admonishes us of the approach of disease, and bids a recourse to such means as Providence has appointed for our relief.

The sick Head-aches of the studious, and the delicate female, connected as they are with acid eructations, nausea, are often effectually relieved, by mild Emetics. To these may be added head-aches, and vertiginous affections, which have often similar connections, and are terminated by the same means.

In an anomalous species of Head-ache, occurring after blows upon the head, they have afforded much relief. I was acquainted with a gentleman, who in a rencountre, received a severe blow the head, with a wound of the scalp. The wound healed very upon favourably, but in a short time, the gentleman was affected with violent head-aches, insomuch that he thought the bones of the head would be torn asunder. The anti-phlogistic treatment was carried to its fullest extent by Dr. Physick, without benefit, the scalp was divided by a crucial incision, with only temporary advantage, at last, recourse was had to Emetics, and with very great effect.

The common impression, that Emetics cannot be resorted to, in cases of severe head-aches, and vertiginous affections, is altogether unfounded—experience proves the contrary, and every day convinces us, that the brain supports the operation of Emetic medicines, under these circumstances, without injury. Witness the apoplectic state of intoxication, and let me ask, is it not wonderful, what a degree of compression, and determination of blood, the brain will sometimes support, and yet return to the healthy exercise of its functions.

In the apoplectic state of Intoxication, an Emetic will effect much in restoring the patient to his senses. Not only in the apoplectic state, will relief be afforded by their use, but in the excited state which precedes collapse. Here, when persons are noisy, quarrelsome, incapable of being controlled, breaking and destroy-

ing every thing within their reach, vomiting will put an end to all these irregular actions, and if effected by an active Emetic (here prefer a solution of Tartar Emetic in water,) the person by its operation is soon made more rational, and falls into a sound sleep. The beneficial operation of this practice, with its influence upon the moral faculty, in exciting disgust, should be a reason for subjecting every drunkard to this treatment.

In Apoplexy, they have been recommended by the physicians of Europe. Their use in this disease, should be regulated with caution, and directed with judgment. In Idiopathic Apoplexy, that is when it arises from the general fulness of the system, I doubt if they could be safely resorted to, from the known tendency of the operation of an Emetic, to drive the blood to the superior parts of the body. But when the disease is symptomatic, or dependant upon the condition of the Stomach, which sometimes happens, they may be resorted to with advantage. In this case, it usually succeeds to a debauch, or from eating a very full meal, and under these circumstances their use is strongly indicated. Their administration will with propriety be preceded by V. S. in order to reduce the volume of the blood. "That apoplexies frequently arise from this cause, I need only refer to the numerous instances of sudden deaths, that are mentioned in the daily papers, nothing being more common than the statement, that such a one dropped from his chair, after eating a full meal. The effect of a full meal, distending the Stomach, seems to act by pressing upon the aorta descendens, and obstructing the free expansion of the lungs, by which means, the arteries of the head become turgid with blood, and the disease produced."—*Fothergill*.

To remove therefore, this determination to the head, active Emetics are indispensable, and they should be carried to the extent of free evacuation, for in proportion as this takes place will be the relief afforded.

In Epilepsy, there has existed a great variety of opinions respecting their utility. There are many cases in which this disease may be traced to derangement of the Stomach and intestines. This is rendered probable by the circumstance of its recurrence; it being observed to make its attack in epileptics, upon any irregularity in diet—to occur very often among children who are much indulged, and that its attacks were seldom renewed, without either an habitual indulgence in eating, or a neglect of necessary exercise. It is therefore probable, that the state and condition of the Stomach, and Intestinal Canal, are greatly concerned in the production of this disease. We know that the irritation from worms, often excites this complaint, and why not irritation from the morbid or undue quantity of the contents of the Stomach. That such is the case, we infer from the relief afforded



by an Emetic, administered during the paroxysm, either in moderating its violence, or bringing it to a close. Whatever doubts may exist as to the propriety of giving an Emetic, during the paroxysm, most practitioners concur in their utility, previous to the fit, when from any particular symptoms, this can be foreseen. Dr. Eberle states, that in a child who had been eighteen months affected with occasional epileptic convulsions, he had succeeded in removing the disease entirely, by a long course of Emetic remedies, administered every third day.

There is one other form of disease, which may with propriety be placed under this head, in which Emetics are useful:—the Convulsive Diseases of Children.

These affections are always alarming, and with those of tender years in a more especial manner. They originate in various causes, often Dentition, sometimes as a consequence of Fevers, and very often from irritating matter in the Stomach. When neither of the above causes exist, I am led to suspect the latter, and direct my treatment accordingly. I have been called to several cases, in which my suspicions have been fully verified. In one instance, the little patient had been eating freely of ground-nuts, and in others, the food of the preceding day remained undigested, having undergone the acetous fermentation, to a considerable extent. In these cases, the paroxysms have only been relieved by evacuating the Stomach and bowels, and no article is so well adapted, as Ipecacuanha, in the first instance, followed by the free administration of Castor Oil. In the alarm which these occurrences always excite with mothers, and the attendants, a variety of remedies are resorted to, with little effect. The warm bath, frictions, mustard plasters, volatile substances of various characters, assafoetida, &c., which are employed on these occasions, are only of secondary importance—relieve the Stomach and bowels, and the convulsions speedily subside. There is no article so safe and effectual as Ipecacuanha given freely, since its operation is intended to be two-fold, to evacuate the Stomach, and to cleanse the bowels.

In many of the forms of Mania, Emetics have been favourite remedies, but they should not be employed, without some discrimination. In the acute states of the disease, which is denoted by great loquaciousness, flushed cheeks, wild and inflamed eyes, &c., their employment would only aggravate these symptoms, by increasing the determination to the brain. On the contrary, our remedies should be of such a nature as would divert action from that organ. Nauseating doses, may with propriety be resorted to, as a means of diminishing action, and producing relaxation. But in chronic Mania, and in another species of derangement, Melancholia, employed in these cases, as a chronic remedy, and

repeated every other day for weeks, I have known productive of the most beneficial effects. In these affections, the Stomach is generally very torpid, and requires large doses. Not only is the Stomach insensible to impressions, but the whole system, inso-much that cold, parturition, &c., produce but little inconvenience or distress. With these views strong antimonial Emetics have been employed, with the happy effect of rousing the patient from that state of mental and physical torpor, with which he is oppressed, restoring sensibility, and renewed susceptibility to the impression of remedies.

In Mania a Potu, Emetics have been strongly recommended. We owe this practice to Dr. Joseph Klapp, of Philadelphia, who was induced to make trial of Emetics, from the opinion that the disease was gastric in its origin. This he inferred from the nature of the substances ejected from the Stomach, the appearances upon dissection, and the effects which follow their operation. This disease afflicts persons who have long been addicted to the intemperate use of ardent spirits. If from contrition for the past errors of their lives, or from an attack of sickness, they are suddenly deprived of their accustomed stimulus, derangement very generally follows. The treatment which was formerly pursued, and is still, by many practitioners, is the employment of opium, in very large quantities, in order to excite sleep, (the symptoms subsiding soon after sound sleep can be induced,) and the use of a cordial, and stimulating regimen. Under this plan of treatment, the patient is gradually restored, but the cure is often tedious and protracted. Dr. Klapp, from observing the effect which accidental vomiting produced in a case of this nature, was induced to make a trial of Emetics, and much success followed their use. This practice was introduced by Dr. Klapp in the Pennsylvania Alms House, at the time I was a resident student in that Institution. Patients, who were admitted in the highest state of excitement, with every characteristic mark of the disease, as well as others, under the milder shades which it assumes, were speedily tranquilized under the operation of the Tartarized Antimony. If the administration of one Emetic was not sufficient to enthrone the reasoning faculties, a repetition of them, provided the strength would admit, seldom failed. The consequences of the operation of the Emetic, was a discharge of thick, viscid, and glairy matter, a removal of the usual tremor, the pulse becoming fuller and more frequent, and the patient soon falling into a sound sleep, from which he commonly awoke restored to reason, and to himself. As, however, he will complain of weakness, from the evacuations he has undergone, it will be proper to administer moderately stimulating drinks, which confirm the cure. The Stomach, in this disease, loses its susceptibility to the action of medicines in

a very great degree, insomuch that I have known a scruple of Emetic Tartar exhibited, before vomiting was produced. It should therefore be given in doses of 2 grains, every 15 minutes, until it operates. It must, however, be observed, that this plan of treatment is not adapted to all cases. In some the constitution is so much broken down, by excessive indulgence, that it would be prostrated under this practice, and I would caution you against its employment. Where, however, the strength of the pulse, and the vigour of the constitution will admit of it, you will find its effects extremely satisfactory, not only more speedily restoring the patient than by the stimulating plan of treatment, but in rendering the system much more alive to the operation of stimulants.

In Hæmorrhages, Emetics have been employed.

In Hemoptysis, they have been recommended by several physicians, particularly by Dr. Robertson, of Dublin. The practice I should not consider safe in this affection, and would strongly dissuade from any attempt to check the discharge of blood, by a recourse to these means, and hæmorrhages from other organs are more effectually controled by other remedies.

In some Local diseases, Emetics have been recommended. The state of nausea, with the diminished action of the heart and arteries, and the muscular relaxation which precedes the operation of Emetics, would entitle them to an attentive consideration in the treatment of obstinate Dislocations. It is well known to you that this state of relaxation has been attempted by other means, as by venæ sect., baths, cathartics, and by local application to the parts. Cases may occur in which one or any of these means would be objectionable, and recourse may be had to the administration of an Emetic. I should consider it decidedly more advisable, than any other of the proposed methods of procuring relaxation, as the object is obtained to as full an extent, without impairing the general health of the patient. All that is to be done is, after ineffectual attempts at reduction, to continue the extending and counter-extending bandages in their situations, and to administer 4 or 5 grains of Tartarized Antimony. The patient will soon complain of a desire to throw up, and shortly after of a disposition to faint. With this sensation approaching, the muscles which had before been hard and tense, become soft and flaccid, when a slight force applied will succeed in reducing the luxation.

There are some other local complaints, in which Emetics have been employed with good effects, these are Hernia Humoralis, and in the suppurative stage of Buboës, &c.

The catalogue of diseases is still incomplete, in which Emetics may be advantageously used. I have only selected the most important, and from the principle being so fully pointed out, on which their good effects depend, I suppose you can be at no loss



in determining upon their propriety or impropriety. There are certain states of the system in which they should be used with caution—These are during the latter months of pregnancy, or when hernia, or prolapsus uteri exist.

*Individual Emetics.*

The articles in this class, have been variously arranged by writers on this subject.

The division which I shall adopt, and which is recommended by its simplicity, is into the Vegetable and Mineral Emetics. Of the former class, no article is more deserving attention than *Ipecacuanha*.

*Family Rubiaceæ. Calycocca Ipecacuanha.\**

Natural History—The genus of plants from which this root is derived, was not well ascertained, until Professor Brotero, published in the Linnean transactions, a description of the plant, accompanied with a plate. It was then distinctly ascertained by the botanists, that the genuine *Ipecacuanha* of the shops, is the root of a Pentandrous plant, the *Cephaelis Ipecacuanha* of some, and the *Calycocca Ipecacuanha*, of other Botanists.

The Natural History of this plant, was for a very long time involved in much doubt and obscurity. For nearly one hundred and fifty years after its properties were known, its characters were undetermined. Linnæus, in his third volume of *Amenitates Academicæ*, gave it as a specific name, to a species of *Euphorbia*, which grows plentifully in this country. He afterwards gave the same name to a species of *viola*.

Decandolle also fell into the same error, and says that there are three species of *viola*, which produce the white *Ipecacuanha*.

In the year 1781, Mutis, then travelling in South America, sent a specimen in full flower to the younger Linnæus, who judged it to be a species of *Psychotria*—a genus formed by his father, for two or three plants that are native of the East and West Indies.

In 1793, Dr. Woodville was favored by Sir Joseph Banks, with a specimen preserved in spirits, which had been sent from Brazil—a drawing taken from it was engraved and published in his *Medical Botany*. It was without a flower, but as its root was entire, there was no doubt of its being the real plant. Its genus still remained in a state of uncertainty, for Dr. Woodville was of opinion, that he could not follow the authority, on which Mutis received his information. We are therefore much indebted to Professor Brotero, for his satisfactory monograph on the sub-

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\* The word *Ipecacuanha* is derived from the Peruvian—Ipi, root, and *Cacuanha*, the name of the district in which this particular root was first discovered—so that the name simply means the root of *Cacuanha*.—*Thompson*.

ject, which was read before the Linnæan Society in 1801, and from an engraving in the Linnæan Transactions, the drawing which is exhibited is taken.

Botanical description.—Root—simple or a little branched, roundish, from 2 to 4 inches long, 2 or 3 lines thick, irregularly bent, brown without, divided into numerous prominent, unequal rings, of an acrid bitter taste, but scarcely any smell.

Stem—shrubby, sometimes creeping at the base, about the thickness of a quill, giving out roots at the knots, and producing one or two new stems, about half a foot from each other.

Leaves—from 4 to 8, near the summit of the stem, opposite, spreading, 3 to 4 inches long, 1 to 2 broad, entire, deep green.

Flowers—aggregate in a solitary head, peduncled, terminal and rather drooping.

Florets—sessile from 15 to 24, inclosed in an involucre, 4 to 5 leaved.

Calyx—5 cleft.

Corolla—monopetalous, with 5 acute recurved segments.

Stamens—five.

Style—thread shaped—germ, egg shaped.

It is a vivacious plant, which flourishes in moist and shady places, in the woods of Brazil, Pernambuco, Peru, and other parts of South America. The roots present in their external appearances, and their chemical composition, varieties, which have caused them to be distinguished into several sorts. Two varieties are found to exist in the shops of the Apothecaries, the ash, or grey, and the brown Ipecacuanha, and it is commonly thought they are derived from distinct plants. The one, *Calycocca Ipecacuanha*, and the other the *Psychotria Emetica*.

The researches of M. Merat have shewn, that these roots are derived from the same plant, the *Calycocca Ipecacuanha*, and the distinctions observed, depend probably upon the nature of the soil in which it grows, or the time of the year at which it is collected. As it is received, it is a *small wrinkled root*, variously contorted, and marked, externally brown, and internally white, having a faint smell, and a bitter, slightly acrid taste.

The root consists of a cortical, and medullary part; and from experiments it appears that it is in the former chiefly, that its Emetic quality resides.

Ipecacuanha was brought into Europe, about the middle of the 16th century, but it did not come into general use, until about the year 1686, when Helvetius, under the patronage of Louis XIV. introduced it into practice, and was rewarded by his patron, with £1000 sterling for the discovery.

Chemical History—To the researches of Pelletier and Magendie we are indebted for a complete analysis of this article.

They have discovered in *Ipecacuanha*, the existence of *Gum*, starch, an extractive matter, an oily matter which possesses great acrimony, and of a penetrating odour, which acts with activity upon the tongue and palate, but which does not occasion vomiting.\*

They have also discovered a *new principle* to which the term *Emetine* has been applied, because in it resides the emetic property of *Ipecacuanha*. When it is dried it assumes the form of transparent scales of a reddish brown color—it has scarcely any smell, its taste is a little bitter, sometimes acrid, but not nauseous.

Exposed to the air, it undergoes no other alteration but that of deliquescence from absorbing moisture.

It dissolves in water, without any alteration in its properties, but acetic acid is one of its best solvents. The analysis therefore, of the Cortical part of the ash or grey *Ipecacuanha*, presents us with the following principles and their proportions.

Emetine, 14 parts—oily matter, 2 parts—gum, 16 parts—Starch, 18 parts—ligneous matter, 48 parts—loss, 2 parts—100. The analysis of the woody part, affords only 1-15 of Emetine, in 100.

Analysis of Emetine—Carbon, 64-57—Hydrogen, 7 77—Nitrogen, 4-30—Oxygen, 22-95—99-59.

Preparation of Emetine—the powdered *Ipecacuanha* is treated with æther, in order to dissolve the fatty odorous matter of the *Ipecacuanha*, and when this solvent has ceased to act, the powdered substance is itself exhausted by means of Alcohol. The alcoholic tincture is then evaporated in a sand-bath, and the extract dissolved in cold water, when it abandons some wax and a little remaining fatty matter. It remains now only to macerate it with some Carbonate of Magnesia, which deprives it of the gallic acid, and then to re-dissolve it in alcohol, and evaporate to dryness. The Emetine thus prepared is not entirely pure, but undergoes other processes to bring it into this state, being then white, pulverulent, unalterable by exposure to the air—the former article bearing the same relation to the pure, that brown sugar does to chrystalized white sugar.

Operation of Emetine—Emetine is much more active than *Ipecacuanha*, and possessing few of the disagreeable qualities of that article, may on all occasions be substituted for it with advantage. In dogs and cats, half a grain to 3 grains introduced into the stomach, produced vomiting, followed sometimes with great disposition to sleep, and return to health, after a longer or shorter lapse of time. In larger doses, as ten grains, the vomiting is repeated, and the animal instead of returning to a state of health,

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\* In this oily matter the peculiar odour of *Ipecacuanha* resides.—*Pereira*.



after the soporific effect is over, dies ordinarily in twenty-four hours.

Upon the human subject, 4 grains in two doses, taken at an interval of a quarter of an hour, produce full vomiting, which is followed by a marked disposition to sleep.

The application of Emetine is the same as Ipecacuanha, and when given to excite vomiting, it will be proper not to administer it in a single dose, as the Emetine being very soluble, and not adhering to the coats of the stomach, it would be thrown up at the first vomiting, which would then cease.

It will be necessary to give it in repeated doses, and the best form is to dissolve 4 grains in  $\zeta$ iv. of water, sweetened with syrup, and to which some aromatic water may be added. It has been recommended by the French Chemists, as a substitute for Ipecacuanha, on account of its more pleasant taste, its small bulk, and its ready solubility in water, and on these accounts the discovery of Emetine, is a valuable one, this article possessing in a concentrated state the properties of Ipecacuanha.

Solvents of Ipecacuanha—The active matter or Ipecacuanha, is extracted by several menstrua, by proof spirits, by wine, by vinegar. By boiling, the strength is lost, the active matter being dissipated; and that it is of a volatile nature is proved by this circumstance, that if a decoction be made, while the substance loses its strength, yet the fluid is not impregnated with it.

With wine, is formed the neat preparation, the Vinum Ipecacuanhæ of the Dispensatories, and it is sometimes substituted for the powder. It is well suited to children, and is often resorted to in their cases.

The strength of the powder is much impaired, by exposure to the light and air.

#### *The application of Ipecacuanha to Diseases.*

Ipecacuanha is the most important of the vegetable Emetics, both for its mildness, efficacy, and the promptness of its operation. It is less powerful than the preparations of antimony, and not so speedy in its action as the Sulphate of Zinc.

It is therefore adapted to a variety of cases in which neither of these preparations could properly be employed, and produces effects, which could not be obtained from any other Emetic we possess. It evacuates the contents of the Stomach, without extending its action beyond this organ, and is therefore well adapted to cases where it is necessary to free the stomach from impurities, and when the diminished strength of the patient would forbid the risk of active Emesis taking place.

It is also from the mildness and certainty of its operation, well adapted to the diseases of children.

In full doses, however, besides evacuating the contents of the Stomach, the action of the duodenum is inverted, and discharges of bile are produced.

The activity of Ipecacuanha is proportioned to the largeness of the dose, though in a less degree than other Emetics, owing to the bulk and partial insolubility of the powder, a great portion is thrown off with the first efforts to vomit.

Its action, however, is much increased by combination with Emetic Tartar or Calomel.

It should be understood, therefore, that when full and frequent vomiting is required, not only to evacuate the stomach and duodenum, but to break up morbid associations, and to bring other parts of the system into sympathetic actions, we must have recourse to other Emetics, and particularly the mineral.

But it is not only as an Emetic that Ipecacuanha is prescribed: it is advantageously employed in a variety of diseases.

In the complaints of the Alimentary Canal, it has been much celebrated.

It was originally introduced with the character of an almost infallible remedy in Dysentery, and other derangements of the Intestinal Canal, and it probably has not lost reputation by time.

In these cases, after the contents of the Stomach and bowels have been freely evacuated, it almost always produces good effects, in small doses, either alone, or in union with opium. It has been said to be particularly adapted to those cases where there is a great discharge of blood, but it is useful in any form, especially if there is much pain and tenesmus.

Of its *modus operandi*, we are not more informed in this instance, than in others connected with the operations of medicines. Different opinions are entertained, but the most plausible is that of Dr. Moseley, who thinks that it acts by its sudorific operation, by which the fluids are determined to the surface. Whatever the theory may be upon this subject, of this I am certain, that in most cases the union of Ipecacuanha with small portions of opium, relieves the griping and tenderness of the bowels, promotes perspiration, checks the discharges of blood, and is upon the whole, one of the best combinations in this deranged state of the Alimentary Canal. It should not be resorted to, until the bowels have been well evacuated, and arterial excitement has been subdued.

In *Diarrhæa*, either in the recent or chronic stages, it is also equally efficacious, employed in the same manner, and with proper attention to regimen, most cases will be found to yield.

In habitual *Diarrhæa*, accompanied with great weakness and irritability of the bowels, Ipecacuanha will be found to succeed after other remedies have failed.

In these cases, it is recommended to begin with doses of  $1\frac{1}{2}$  to 4 grs. in the morning. This will sometimes act as an Emetic, with biliary evacuations, sometimes it proves Cathartic, and gives a few motions downwards—at night an anodyne should be given, if there is nothing to forbid it.

The Ipecacuanha is to be repeated or omitted the next morning, according to its operation the preceding day—if it has been considerable, it should be omitted till the morning following, but the anodyne is to be repeated at bed time. A few doses, with proper attention to regimen, is commonly sufficient to restrain these discharges. In this manner, by its evacuating operation, it cleanses the Stomach by vomiting, or the intestines by acting as a purgative. It does more—it acts as a Diaphoretic, the perspirable matter being thus discharged by those emunctories through which it ought to pass, and the bowels relieved of a quantity of acrimonious fluid, the presence of which aggravates, if it is not the most frequent cause of such complaints.

In Dyspepsia it has also been recommended very highly. It is to be given in such doses as will not excite any painful sensations of nausea, but sufficient to produce a slight action upon the Stomach, by which its viscid contents are separated and expelled from that organ.

There are some people who can take to the amount of two grains without nausea, and others who cannot take more than a third or fourth part of a grain. It is therefore proper to begin with a small dose, and to augment it gradually (if it is necessary) to the point at which the action of the remedy begins to be felt. Some persons prefer giving the Tincture of Ipecacuanha, in doses of a few drops, 8 or 10 drops, 2 or 3 times a day.

The effect of this medicine is in some degree alterative, as it promotes the secretion of the gastric juice, and excites the action of the Stomach, two objects of considerable importance to be gained in the treatment of this disease.—*Memoir by M. Daubenton.*

Ipecacuanha has been employed in Hæmorrhages of every description. In Hæmoptysis it has frequently been employed in nauseating doses, and it is said to be equal, if not superior, to the Sac. Saturni in these cases—care must be taken, however, that vomiting is not excited, otherwise bad consequences would be likely to ensue.

I am aware that vomiting has been recommended by some physicians in this disease, and it has in some cases been known to put a stop to the further discharge of blood; but in others it has increased the hæmorrhage to a great and alarming degree, and the possibility of such an accident, should render us cautious in the use of the remedy.



In Uterine Hæmorrhage this medicine also exhibits good effects. Given in small doses of half a grain every half hour, it has succeeded in the hands of Bergius and others in restraining severe discharges of blood from this organ. The operation of Ipecacuanha, is more intelligible in restraining Hæmorrhages than in other cases, and that without attributing to it astringent or antispasmodic properties, as has been asserted by some writers. It seems to act by exciting nausea, which when produced, has a great effect in diminishing the action of the heart and arteries, and lessening the impetus of the blood.

To this we may add its equalizing the circulation and exciting a discharge from the cutaneous vessels. In these Diseases it is employed in doses of half a grain to 2 grains, every 3 or 4 hours, either alone or combined with opium.

Besides these diseases, Ipecacuanha exerts an action on the Mucous membrane of the Bronchia and Fauces, which renders it of service in Catarrhal and Pneumonic disorders, and in the different states of these complaints, it exerts a diversified and seemingly opposite action, not only promoting expectoration in cases where the mucous membrane is inflamed and dry, but likewise serving to restrain the secretion when it is inordinate and excessive.—*Bigelow.*

It is in Catarrhal and Pulmonic affections in children, and adults, that this article is particularly valuable. In all cases, from the mildest to the severer forms of Typhus Pneumonia, or congestion on the Lungs, there is no practice to be compared with the Emetic, and none which affords such decided relief. Most practitioners will concur in this opinion—but they stop short of the beneficial effects which can be produced, by limiting their use to a single Emetic, or to the beginning of the disease. They should be repeated two or three times a day, until relief is afforded. Large doses of Ipecacuanha are not required for this purpose; small doses are equally efficacious.

It is my practice to give in these cases, from one to three grains, every two hours, in a little tea until vomiting is accomplished. The Emetic effect being obtained, the doses are continued to the same extent, until a decided impression is made upon the system. When this becomes apparent, by the greater freedom in breathing, the improved countenance, the developed pulse, and the increased discharges from the surface, the doses are lessened, or the intervals increased. I am so convinced of the utility of Ipecacuanha in these cases, and even in Febrile diseases, that were I limited to the use of one article in the M. M. that would be Ipecacuanha.

• In Asthma an Emetic affords great relief, and this not only from the benefit which the mechanical operation of vomiting would pro-

duce, in enlarging the cavity of the Thorax, removing the congestion of the lungs, and expelling the viscid mucus which collects in the Bronchia and Trachea, but from an antispasmodic operation exercised by the article itself. This last mode of operating I cannot admit, though supported by the authority of Akenside, the poet as well as physician. From a frequent trial of it, in these cases, I do not think that it possesses any advantages over other Emetics, which I have employed for the same purpose.

It was the practice of the same gentleman, to continue the Ipecacuanha, in doses of four or five grains every morning in the intervals, to excite nausea, with a view to a permanent cure. This practice I have imitated, though not in as large doses, and with effects which have been highly gratifying. It was administered after other means had been unavailing, in doses of a grain, combined with Liquorice powder, every two hours during the paroxysm, and in the intervals, night and morning. By this means the paroxysm has been much moderated, and the patient been able to resume his duties as a mechanic. In another case now under treatment, in which the disease had continued for several months, resisting a variety of remedies, the Ipecacuanha in similar doses, night and morning, bids fair to accomplish more than has yet been effected by other means.

Ipecacuanha combined with Opium, and a portion of the Sulphate of Potash, forms the very valuable Diaphoretic called Dovers Powders—united to purgative medicines in nauseating doses, it gives to them greater activity, and may occasionally be joined with them, when the determination to the surface is also required.

*Incompatible Substances.*—The substances which weaken or destroy the powers of Ipecacuanha, and therefore called Incompatible, are all Vegetable astringents, as infusions of galls, green tea, &c., the vegetable acids, as the acetic.

It may not be improper to notice the action of Gallic acid upon the active principles of Ipecacuanha. This acid precipitates Emetine from its solutions either aqueous or alcoholic, and contracts with it an intimate union, which changes its nature, and takes from it its Emetic property. In those cases, therefore, where it has been given in too large a dose, and where it exerts violent effects, nothing is easier than to destroy its activity, it being only necessary to administer a decoction of galls, or a strong infusion of green tea.

Messrs. Pelletier and Magendie, have tried upon themselves the power which this decoction possesses of neutralizing the activity of Emetine.

The same means are of course sufficient, where it is necessary to blunt the effects of Ipecacuanha.

The powder and solution are the forms of exhibiting Ipecacuanha. The former is the most energetic, although the vinous solution is both active and convenient.

The medicinal operation of Ipecacuanha, varies with the dose. Thus 10 to 30 grains, act as an Emetic—1 to 4 grains, as a Diaphoretic, in smaller doses as the one fourth to half a grain, Alterative and Expectorant.

Combined with Opium, its Diaphoretic property is increased as already observed.

*Upon the Doses of Medicines.*—I may make this general remark, which I hope will be recollected, whenever the subject is alluded to, that large and small doses of medicines are merely relative terms, and should never be understood as denoting absolute quantities, for what would prove a large dose in one person, might prove trifling in another. I have had occasion to give as much as  $\zeta$ ss of the tincture of Digitalis, in twenty-four hours, and this continued for several days, before its effects upon the system were produced. Dr. Cartwright, in the Pneumonia Biliosa, of Natchez, has employed the Tartarized Antimony, with great advantage, but has found it necessary to administer from 16 to 20 grains in divided doses, before its effect was produced on the system.

The general rule of conduct, ought to be derived from the sensible effect of our practice. Every dose of medicine, however large, is too small if it stop short of the usual sensible operation on the constitution. This is to be the rule in the use of medicines—the system is to be placed fully under their influence, and when this has been done without effect, the remedies must be changed for others. Were this general rule more closely attended to, we should not so often complain of the inertness of our means, or the obstinacy of diseases. Diseases and Debility are kept up by what is called cautious practice. Practice which is regulated rather by the quantity of prescribed medicines, than by the effects produced.

#### *Adulterations of Medicines.*

While upon this article, I shall take occasion to put you on your guard in selecting medicines, and to remind you of the unpardonable adulterations, too frequently practised. There are perhaps few articles upon which ingenuity has been more exercised, to impose upon the credulity of mankind, than the present. Of the various substances which have been sold for Ipecacuanha, I will merely mention a few. The roots of the Gillenia Trifoliata, the Euphorbia Ipecacuanha, and the Phytolacca Decandria, or Poke, have all been sold for this article. The roots of Sarsaparilla, have been powdered and combined with the Tartar of Antimony in imitation of the Ipecacuanha.



The frequency with which these adulterations are practised renders it necessary to mention to you, that it is not advisable to purchase large quantities of any medicinal substance in powder, and as frauds are often committed in a manner to elude detection, I would advise that whenever it is practicable, to procure as many of your medicines in the root as is possible. I could inform you of adulterations of other articles, which would excite surprise to a great degree, particularly in the common article Peruvian Bark. In Gray's supplement to the Pharmacopœia, may be seen a recipe for the formation of a factitious Peruvian Bark, consisting of Peruvian Bark, Mahogany saw dust, and oak saw dust ground together. Powdered Gypsum has been sold for Cream of Tartar. In Boston, the occupant of a wind mill was indicted for grinding Gypsum into Cream of Tartar.

I shall therefore on all occasions point out to you the frauds which are committed with medicines, and by presenting you with the best specimens of the article treated of, so familiarize you with their sensible properties, as to enable you to discover villainy, in this most foul of all its practices.

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*N. Family Rosaceæ.—Spiræa Trifoliata, vel Gillenia Trifoliata or Indian Physic.*

Class Icosandria, Di-Pentagynea.

Calyx—tubular, campanulate, border 5 toothed.

Corolla—partly unequal, petals 5.

Stamens---20, and small, styles 5.

Leaves---ternate, lanceolate, serrate.

Stipules, linear, entire.

Stem---herbaceous, 1 to 2 feet high.

Root---perennial, small, slender, and irregular, divided into many parts, and furnished with an infinity of small fibres. The roots resemble in structure, colour, size and taste, though indistinctly, the common Ipecacuanha of the shops.

It grows plentifully in various parts of the United States, and in the upper districts of this State, flowering in June and July. The root is the only part employed, though the stems possess the same properties.

They generally run a little distant from, and sometimes very near the surface of the earth, in various directions, similar to Ipecacuanha.

They are composed of a cortex or bark, and ligneous substance.

The cortex or bark is made use of in medicine, and the Emetic property resides principally in this part, though the ligneous matter is not without activity.

The root, the part used, is best given in powder, when it will prove a certain and manageable Emetic, and at the same time

perfectly safe in its operation. True it is that it will not produce those convulsive contractions, which arise from the Mineral Emetics, but in mild cases requiring the employment of Ipecacuanha, it may with advantage be substituted.

As it is nearly allied to the Ipecacuanha in its character and operation, it may be employed in the diseases, in which that substance exhibits its good effects.

It has been experimented with by different individuals, and by Dr. De La Motta of this city, and found equal to Ipecacuanha, in its Emetic operation, and its application to the ordinary diseases in which the article is useful.

The dose of the Gillenia, is 30 or 4 grains of the powdered root, which gives to Ipecacuanha a decided superiority, the bulk being a great inconvenience. This objection may be obviated by combining a grain or two of Tartarized Antimony with 15 grains of Gillenia.

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*Family Euphorbiæ.*—*Euphorbia Ipecacuanha*, *Ipecacuanha Spurge*, is another of the Vegetable Emetics, with which our country is enriched. It grows well in the Middle and Southern States, and is peculiar to this country. The root is the only part used, and before we were better acquainted with the true origin of the officinal Ipecacuanha, was supposed to be the plant from which that drug is obtained.

*Euphorbia*, general character.—Nearly all the plants of this genus are remarkable for their activity, when applied to the human system, not only acting upon the Stomach and Alimentary Canal, when taken internally, but producing redness, tumefaction, and excoriation of the skin, when applied to the surface. They all abound with a milky fluid, which is discharged very freely when the plant is broken.

*Euphorbia Ipecacuanha*—Is a low and tufted plant, growing in sandy soils, in the Middle and Southern States, found in considerable quantity in Colleton and Edgefield Districts. The root is large, proportioned to the size of the plant, and runs very deep into the earth.

The stems are numerous, erect and procumbent, forming large branches on the surface of the ground.

The leaves are inserted on the joints, opposite, sessile, smooth.

The flowers are solitary, on long peduncles or foot-stalk, from the forks of the stem.

The *Euphorbia Ipecacuanha*, is the most active of any of the Vegetable Emetics I have enumerated, differing from them in having its action extended to the bowels, and operating as a cathartic with a considerable degree of activity.

The testimony in support of its Emetic powers is sufficiently ample, Drs. Bigelow and Barton, considering it a safe, certain, and manageable Emetic, applicable to most of the cases in which medicines of this kind are called for.

The dose is from 15 to 20 grains. If the first does not operate, it may be repeated, but it does not admit of frequent repetition, since violent effects are sometimes apt to ensue. In this respect it differs considerably from the officinal Ipecacuanha, which admits of being administered in repeated doses, and of being accumulated in the Stomach, until its specific effect is produced, without any injurious consequences resulting.

*Euphorbia Corollata*.—Of the same genus, and related to the foregoing in its effects, is the plant I present you.

Its character is as follows—

Root, large, branching.

Stems numerous, frequently growing to the height of 2 or 3 feet.

Leaves are scattered and sessile, oblong and obovate.

The stem divides at the top of the plant into a large five rayed umbel, supported by an involucre of as many leaves. The rays of the umbel are divided into two or three branches, supporting flowers. Upon breaking the branches, there flows out a milky fluid which possesses very acrid properties.

The root is the part used, and it is equally as active as the *Euphorbia Ipecacuanha*, and might be employed advantageously as an Emetic.

The dose of the powder is from 15 to 20 grains. It also frequently has its action extended to the bowels, operating upon them as a cathartic. These articles, besides their Emetic properties, are used for other purposes.

In small doses of from 8 to 10 grains, they operate upon the bowels, and in smaller doses, as 2 or 3 grains, as a Diaphoretic, combined with opium, or the antimonials.

I have employed these articles for their evacuant and Diaphoretic operation, and am satisfied that they may with safety and advantage be employed for these purposes. On several occasions I have had recourse to them, and consider them fully entitled to the consideration of the profession. Even should they not be employed, every physician should be instructed in their properties, and when occasion requires, know the substitutes he can apply to in case of need.

In concluding these articles I would recommend them to gentlemen practising in the country, little doubting, that with the precautions I have mentioned, they will be found valuable, and good substitutes for the *Ipecacuanha*. Their operation seems exactly proportioned to the quantity taken, and the vomiting is not checked as in *Ipecacuanha*, by the powder being thrown off in the first efforts of the Stomach.



Besides these articles, there are a variety of other plants which may be used as Emetics. It would be tedious to enter into their particular consideration. A simple enumeration will be sufficient, and among them will be found plants which are familiar to you.

They are, *Sanguinaria Canadensis*, or Blood root; *Lobelia Inflata*, Indian Tobacco; *Aralia Spinosa*, Prickly Ash; *Eupatorium Perfoliatum*, Thoroughwort; *Stylingia Sylvatica*, Queen's Delight; *Erythronium*, or Snake leaf; *Phytolacca Decandria*, Poke.

Upon the *Lobelia*, as much as has been said of its virtues of late, a few remarks may be made. The common name by which it is known is Indian Tobacco.

It is a biennial plant, and is found growing in most parts of the United States. The family of the *Lobelia's* is a very extensive one, and medicinal properties of great value have been ascribed to several of them. Some of the family are characterized by their very striking and beautiful appearance.

The *Lobelia Cardinalis*, is probably one of the most showy and conspicuous flowers in our woods, and by being introduced into gardens, the care bestowed upon its cultivation is returned, in the greater number of flowers formed upon it, and their more brilliant appearance.

The *Lobelia Inflata*, is the most active of any, and may be considered among the most useful of our indigenous medicines.—It is a small plant varying in height from six inches to two feet.

The root is fibrous.

Stem erect, much branched, angular.

Leaves are scattered, sessile, oval.

Flowers in spikes, each one in the axil of a small leaf.

Corolla, bluish purple.

It exudes a milky juice upon being broken, and is found growing in the mountains and upper counties of Carolina and Georgia.

The properties of this plant are Emetic, Diaphoretic, Expectorant, and in some degree Narcotic. When taken in the form of infusion or tincture mixed with water, it has an acrid pungent taste—when swallowed it is followed by a sensation of roughness in the throat, with a prickling which continues some time. This impression being of a stimulating character frequently excites a copious secretion of salivary and mucous fluids, with hawking and a more free expectoration. In the Stomach nausea is excited, and when in large doses, vomiting frequently succeeds.

As an Emetic it is not distinguished by any peculiarity of operation, which would render it particularly worthy of attention.—On the contrary, by its pungent irritating action upon the Stomach, and the violent effects which sometimes follow its use, it becomes a more exceptionable article than many which are employed, and which I have recommended.

This article from its Expectorant, Narcotic, and often Emetic operations, is frequently very useful in Asthmatic affections. Few diseases, without being dangerous, are more distressing. In my practice, I have a dozen patients disposed to this affection, and from the exposure many of them are obliged to undergo, with every great change in the weather, attacks in some are brought on. Persons so predisposed become, I may say, living barometers: every change of weather is sensibly felt, and where the comforts of life do not abound, paroxysms of Asthma frequently succeed. I have had occasion to try various remedies—venæ sect., Emetics, Cathartics, opiates, antispasmodics, pectorals, counter irritants—and though great relief is afforded by some, and often all of them, yet it is often effected with considerable expense of the vital powers. This is a great objection in many cases, since the system is often much enfeebled by the frequent recurrence of these paroxysms. I have for several years past, employed the Lobelia, and have derived more benefit from its use, than from any other single agent. It has appeared to shorten the paroxysm in some instances speedily, in others more slowly, and has even appeared to prevent their occurrence in others. In one case in which the disease continued an unusual length of time, threatening thus to become habitual, I had a fair opportunity of experimenting very freely. A variety of articles were employed with but temporary benefit, at length the Lobelia was given, and without any inquiries being made of the comparative efficacy of the several means which had been used, the observation made by the patient was, that he had been more relieved by the Lobelia than by any thing else which had been tried.

In the severest paroxysm which I have ever witnessed, complete relief was afforded, and the subsequent paroxysms greatly mitigated by a compound as follows—

Tincture Lobelia.

Compound Syrup of Squills.

Simple Syrup of Squills, each equal parts.

A dessert spoonful was given every ten minutes during the paroxysm, until relief was afforded. The patient had no return of the disease for nearly a twelvemonth.

Forms of exhibition.—It may be given in powder, in tincture, and in infusion.

In Powder, the dose is from 20 grains to a teaspoonful, as an Emetic.

The tincture should be prepared afresh every half year, as it loses much of its activity, by being long kept. The recent plant should be preferred. The dose of the tincture will vary from a teaspoonful to a tablespoonful—when designed as an Emetic, to be repeated every ten or fifteen minutes—when its expectorant operation, every hour or two.

The infusion is rarely employed—with sugar or treacle a syrup may be formed, which may be advantageously used in the catarrhal affections of children, and in threatened croup. This preparation will be found more active than Squills, and more readily taken.

In thus presenting you with various articles possessed of Emetic properties, I hope that their consideration will not be deemed useless. Many of them, I admit, are very inferior to the Ipecacuanha, but as this article is often adulterated, is purchased at a high price, and may not be in your shops when wanted, it becomes highly necessary that you should be acquainted with the substitutes about you. Many of these articles if more experimented with, would, I have no doubt, be found more valuable than they at present are thought to be, inasmuch as the doses would be better determined, the circumstances under which they should be used.

To assist you, several works, as Bigelow & Barton, and Rafanescques' small work on Botany, may advantageously be referred to.

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*Family Solanææ.*—*Nicotiana Tabacum*, Tobacco, is the next article of which I shall treat. This substance is not commonly placed under this class, as it possesses so many other properties—being Narcotic, Errhine, Sialagogue, Purgative, as well as Emetic. Possessing the latter property in a considerable degree, it may be proper to consider it under this head.

*Natural History.*—Tobacco was not known in Europe until after the discovery of America, and was first imported about the year 1560, as some say, by Sir Francis Drake.

The Spaniards who gave it the name of Tobacco, took it from Tobaco, a province of Yucatan, where they first found it, and first learned its use—or according to others, it derived its name from the Island of Tabago or Tobago.

The French at its first introduction among them, gave it various names, as Nicotiana, from John Nicot, the Ambassador of Francis II. in Portugal, who brought some of it from Lisbon, and presented it to Catharine de Medicis, as a plant of the new world, possessing extraordinary virtues.

Previous to its introduction into France, it had been brought into England by Sir Francis Drake, and the custom of smoking in England is ascribed to Sir Walter Raleigh. Its power to excite a train of pleasing reflections, as well as to calm the agitations of our nature, depends upon the Narcotic principle which it possesses.

*Chemical History.*—Besides various principles, Tobacco contains a peculiar proximate one, upon which the properties of the plant are supposed to depend, and which has been



called Nicotin. Vauquelin considers Nicotin as approaching the volatile oils in its properties—it is colourless, has an acrid taste, with the peculiar smell of Tobacco—and occasions violent sneezing. The Medicinal activity of Tobacco resides in this volatile part. Water, wine, alcohol, are therefore solvents for the medicine. Long boiling dissipates its activity, so that the decoction and extract are weak preparations.

The oil may be obtained by distilling the leaves, and separating it from the top of the water, upon the surface of which it will be found to float. This oil was found to destroy the life of cats and kittens and other animals almost instantly, in the small quantity of two drops, either by applying it to the tongue, or injecting it into the rectum.

Medical History.—Tobacco is a well known drug, of a Narcotic quality, which it discovers in all persons even in small quantities when first applied to them. A small quantity snuffed up the nose has produced giddiness, stupor, and vomiting, and when applied in other ways in a large quantity, there are many instances of its more violent effects and some of its proving poisonous. In these instances it operates in the manner of other Narcotics.

Along with this quality it possesses also a strongly stimulant power upon the whole system, but especially upon the Stomach and intestines, so as readily, even in small doses, to prove Emetic and purgative. It has been used as an Emetic, and said to be particularly adapted to evacuate poisons, which produce a torpor of the Stomach, and which therefore requires some violent medicine to act upon it. As it possesses no peculiar good qualities, and as its operation is commonly attended with much sickness, it has not, nor is it likely ever to come into practice with physicians.

Externally applied, in the form of Cataplasm of the moistened leaves, it often rouses the Stomach and occasions vomiting. In this manner it has been employed with complete effect, to expel an inordinate quantity of laudanum, taken with a view to suicide, when other Emetics had failed. The cases, however, in which it is most commonly used, is in obstinate constipation of the bowels, and in Strangulated Hernia, as an Enema, and the manner of preparing it is as follows—

Fol. Nicotiana, ʒi.

Water ʒbi.—simmer for a short time.

One half to be used, and the other in an interval of half an hour, if necessary. It overcomes the obstruction, by the extreme relaxation it produces, and by its cathartic operation. It must, however, be used with caution, as several lives have been lost by too strong an infusion being thrown into the rectum.

The smoke of Tobacco has been used for the same purposes, introduced into the rectum, and it is very powerful, owing to the

activity of the volatile part of the medicine. It possesses some advantages over the Infusion, being more mild and therefore more safe.

Tobacco has also been employed, by Dr. O'Bierne, in the treatment of Tetanus, and much success is said to have followed its employment. I am unable to furnish any details of the method pursued, the work not having reached this country.

The manner in which Tobacco is used, is in the form of Enema, thrown into the colon, by means of a flexible tube introduced into the rectum. His practice is detailed in his work upon Defæcation, and presents a list of twenty cases, eleven of which recovered. He adverts to the disease in the horse, in the treatment of which, his method in the hands of the veterinary surgeons, had been attended with success.

United with Cerate in fine powder, it has been employed for its nauseating and relaxing operation in other Spasmodic diseases.

In Cynanche Trachealis, or Croup, it is applied in the form of a plaster, to the upper part of the sternum. Cases of this disease have been treated after this manner and with very happy effects. Employed at the very commencement it has succeeded in arresting the complaint, and in conjunction with other means, has on other occasions been instrumental, by exciting vomiting, to aid very materially in relieving the patient.

Besides these diseases, it has been employed in Dropsies, as a Diuretic, and by some physicians it is stated, with considerable success. The manner in which it is used I shall speak of hereafter.

The poisonous effects of Tobacco are more likely to follow its employment as an Enema than as an Emetic.

When an accident of this kind occurs, it is proper to know that the Infusion or the Tincture of Galls throws down the Nicotina, and renders the Infusion of Tobacco inert, and consequently should be instantly administered.—*Thompson.*

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*Family Asphodeleæ.*—*Scilla Maritima* or *Squills*—Is a large bulbous plant belonging to the Lilly family, which grows on the sea coast, and of which the bulb only is employed in medicine.—The bulb increases to a considerable size, and is composed of Tunics or coats inclosed one within the other. The exterior is covered with scales of a brownish color, the interior Tunics are white and fleshy, the exterior being sometimes tinged with red, without any perceptible odour, but abounding with a juice, viscid, bitter, and acrid. The scales are found in the shops separated the one from the other and dried. By drying the root it looses much of its acrimony, but it is still a very active medicine.

It is brought to us from the shores of the Mediterranean, and is a native of Spain and Italy, and from its growing in sandy soils on the sea coast, it has the name of *Maritima*.

The recent root is less active than the dry, in consequence of its containing a considerable portion of watery juice, which escapes in the process of exsiccation.

Analysis of Squills.—M. Planche has discovered Tartrate of Lime. According to Vogel, it contains when dried, gummy matter, a principle very bitter and acrid, which has been called *Scillatine*, and which is the essentially active principle—tannin, citrate of Lime, a sweetish substance.

By M. Tilloy it has been thought that the *Scillatine* of Vogel is not an immediate principle, but a mixture of uncrystallizable sugar, with a matter essentially acrid and bitter. It is white, transparent of a resinous fracture, deliquescent, soluble in water and alcohol. It is obtained by subjecting the expressed juice to the action of alcohol, and in decomposing the alcoholic solution by means of the acetate of Lead. It is not used in medicine.

Medical Uses.—The root of the Squill appears to have been known as a medicine in the very early ages of Greece, and was employed by the Egyptians in dropsy, under the name of the eye of Typhon. It has well maintained its character ever since, and is deservedly held in great estimation.

The Squill possesses many and diversified powers, being not only Emetic and Purgative, but Diuretic and Expectorant, on which account it is employed in many cases.

In large doses it stimulates the Stomach and proves Emetic, but it is seldom used for this purpose, and its place is better supplied by other articles.

In smaller doses its Diuretic properties are obtained—but I shall speak of these under that head—with its application to diseases.

Squill yields its active properties, to water, vinegar, ardent spirits. The preparations in most common use are the powder, vinegar, and oxymel of Squills. The mixture of acid with the Squills renders the taste of Squill more supportable, and adds to its Expectorant properties.

Dose.—Of the Powder, as an Emetic, it forms 8 to 10 grains.

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#### MINERAL EMETICS.

Having completed my description of the Vegetable Emetics, I shall next proceed to the second division, or those derived from the Mineral Kingdom—and at the head of these must be placed the preparations of Antimony.



Antimony is a ponderous brittle mineral, or semi-metal, of a bluish white colour, of a shining surface, and striated texture. It is seldom or never found pure, but combined with sulphur, and is obtained from mines in Hungary, Germany, France, and England. The best is said to be brought from Hungary. Antimony, called Stibium by the ancients, receives its name from Basil Valentine, a German Monk, who gave it, as tradition relates, to some hogs, which after purging, it greatly fattened—thinking in like manner to feed his brother monks, all of them perished by the experiment—hence it was called anti-monk, and by corruption Antimony, from anti-monos.

The preparations of Antimony, like most other active articles, found their way into the practice of medicine with great difficulty. Basil Valentine in the sixteenth century, 1596, first brought them into credit as internal medicines, and soon after published a work, setting forth their uses and their applications. From their occasional violent operation and the dangerous consequences which followed their injudicious employment, they fell into disrepute, and were denounced by the Medical Faculty of Paris as poisonous. They were, however, received by Paracelsus, and by him employed as powerful and efficacious remedies. After this they were alternately received and rejected, until by the labours of Hoffman, and still more, Cullen and Fordyce, they became established in regular practice, and are now ranked with the most valuable articles the *Materia Medica* affords.—*Parrs' Medical Dictionary*.

Antimony in its native state, existing as a sulphuret, to which the term crude Antimony is applied, exerts very little action, upon the human system.\*

To render it active it has been submitted to a variety of operations by the chemist, the consequence of which is, that the preparations of this article have been multiplied to considerable extent, and its pharmaceutical history is well understood. Differing as these preparations do in degrees of strength, they are characterized by a considerable uniformity in their action. On this account, I shall glance cursorily over them, and will only employ your time in commenting upon the most important.

#### *Preparations of Antimony.*

Antimony existing in its native state, combined with sulphur, owes its inertness upon the system to the large quantity of this article which enters into union with it. It is obvious that when this is separated to a certain extent, (for when wholly separated as in the state of regulus, it is insoluble in the juices of the Sto-

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\* If the Stomach be acescent, it operates with violence—when there is little or no acid present, it produces scarcely any action upon the system.

mach,) the more active it will become, and accordingly the different preparations from crude Antimony, depend upon the different proportions of sulphur which they contain, and the different substances employed for its separation.

The different means in use, to give activity to Antimony, are—

1. Trituration.

2. The action of heat and air,—of these preparations none are retained in practice.

3. By the action of the Alkalies.—Under this head is the *Kermes Mineral*. This is prepared by boiling a solution of Potash, on Sulphuret of Antimony, for a certain length of time;—(three hours)—the liquor when strained and allowed to cool deposits a red colored powder, and is known by the name of Kermes Mineral, or the Sulphuretted Hydroguret of Antimony, containing 2 proportions of Antimony, and 3 of Sulphur, called also a Sulphuret of Antimony, and a Sub. Hydro. Sulphate of Antimony, according to the French.

Nearly allied to the Kermes, is another preparation, commonly called the *Golden Sulphur of Antimony*. It is prepared in nearly the same manner as the former, except that the precipitate from the strained liquor, is thrown down when the mixture is warm, by diluted Sulphuric acid, which becomes of a light or orange colored powder, being termed in the shops Sulphur Auratum Antimonii, or the Sulphuretted Sub Hydro Sulphate of Antimony. These preparations coincide nearly in their action upon the human system, except that the former containing less sulphur, must be given in smaller doses than the other. These medicines are little known in England and this country, but in France and other parts of the continent of Europe they are much employed.

Given in small doses, they exert a considerable influence on the coats of the Stomach, producing nausea, and promoting considerably the secretions of the skin and lungs.

The action is often extended to the Alimentary Canal, and a purgative operation frequently follows their employment. Hence at a proper period they are valuable in inflammatory affections of the lungs, in pneumonic complaints, and in catarrhs, either of an acute or chronic character. I have on several occasions had recourse to these articles, and can with confidence recommend them to you, as remedies upon which dependence is to be placed in diminishing morbid excitement, and by determining to the surface, allwoing that irritation of the lungs, which excites and provokes coughing.

I have on several occasions relieved very distressing coughs by the use of this article, rubbed up with a solution of Gum Arabic,  $\mathfrak{zss}$  to  $\mathfrak{ʒii}$ . with  $\mathfrak{zvi}$ . of the solution. The nausea it excites diminishes action, and determines to the surface, while the pulmonary se-

cretion being augmented, expectoration is more easily performed. With its use other means are necessarily conjoined, as *venæ sect.* before or during its employment, evacuants generally, regimen, and confinement to bed, the surface kept warm.

Treat all pulmonary affections, even mild ones, as important, and you will less seldom err, from too much than from too little caution. Recollect that most diseases commence with irritation of function, and pass often rapidly into derangement of structure.

They are useful in Febrile affections, and may well be substituted for *Pulv. Antimonialis*, being not only more uniform in their operation but decidedly more energetic. The usual dose for the fulfilment of the above purposes, is from ii. to iij. grains.

In large doses from vi. to x. grains, it operates as an Emetic. These are the principal preparations with the Alkalies.

4. By the action of Nitre on Antimony, we obtain the *Crocus Antimonii*, and the *Calx Nitrata*. The former is so violent in its operation, that it is wholly rejected in the practice of Physic, and the latter is superseded by the more valuable article the *Pulvis Antimonialis*.

#### *Pulvis Antimonialis.*

It is prepared by exposing the Sulphuret of Antimony and harts-horn shavings to a white heat for a certain time. The animal matter, and the Sulphur of the Antimony are driven off, leaving an oxyd of Antimony, with Phosphate of Lime, which combined together form the Antimonial powder of the shops, or the oxide of Antimony with the Phosphate of Lime.

These are the principal preparations from the Sulphuret of Antimony.

With the oxydes of Antimony united with acids, so as to form salts, there have been many preparations in use,—but few are employed at the present time. The most important is the Emetic Tartar, a compound of oxyde of Antimony, Tartaric acid and Potash.

*Antimonium Tartarizatum.*—Is the most valuable of all the preparations of Antimony. Its chemical history is involved in some doubt, and is still unsettled, It is stated in the various dispensaries to be a triple salt, consisting of Tartaric acid, oxyde of Antimony, and Potash, and which therefore ought to be termed a Tartrate of Antimony and Potash. It is obtained by boiling Bitartrate of Potash with protoxyde of Antimony, in a glass vessel for a quarter of an hour, and setting the liquor by to cool. In this process, the excess of Tartaric acid in this Bitartrate, is saturated by the Protoxide of Antimony, and by evaporation and crystallization a triple salt, Tartrate of Antimony and Potash, is procured. It is of a white colour and a taste slightly stypic and metallic. It is sufficiently soluble in simple menstrua, and as it is almost entire-



ly insipid and the requisite dose is in almost all cases comparatively small, it may be given (to children) where it would be difficult if not impossible to get down any other medicine.

As an Emetic, it is distinguished by the promptness, energy, and certainty of its operation. It excites the Stomach into forcible and continued efforts to discharge the whole of its contents, and by its action being extended to the duodenum, its contents are thrown into the Stomach, and large evacuations follow its employment. The operation of Antimony is also extended to the Alimentary Canal, and hence it often proves considerably purgative, this effect taking place either when the dose has been greater than necessary, merely to produce vomiting, or when the stomach has escaped the action of this powerful medicine. Antimony appears to promote almost all the excretions, and to quicken and stimulate the action of the absorbent vessels. From its operation upon these several parts of the system, it is preferred to all other Emetics, doing more to break up the morbid associations which are formed in diseases, to relieve the Stomach of its offensive contents, and to effect a solution of fever, than any other article with which I am acquainted. It is therefore at times adapted to the commencement of the continued fevers of our climate, in which when liberally and properly administered, it does much to bring the disease to a crisis at the onset.

In Intermittent, Remittent, and continued Fevers, this medicine is therefore properly resorted to in the early stages. The first object of the practitioner is to arrest the febrile action if possible, in its very commencement. This is accomplished by the use of such remedies as have the power of exciting a considerable shock or commotion in the system. One of the most efficacious of these means, when they can be employed, is the use of Emetics, which possess this great advantage, that they may be employed at any period of the paroxysm. If an active Emetic, (the best I consider is the Tart. Antimony in combination with Ipecacuanha,) be employed during the continuance of the *chills* and free vomiting is excited, the cold fit is often speedily terminated, and a general glow accompanied with a degree of perspiration is produced. If the Emetic is delayed until the *hot fit* has commenced, its operation is frequently followed by a free perspiration, as well as relief to all the concomitant symptoms, and the fever, especially if aided by other means, is frequently interrupted in its progress. Should it fail in bringing about a crisis of the fever, the Antimonial preparations may still be continued during its progress in very minute doses. Whether they should be carried to the degree of producing *nausea*, has been a subject of controversy among very distinguished physicians. With Dr. Cullen, Emetic Tartar was a favorite medicine in fevers, and he always recom-

mends it, when speaking of it, in nauseating doses. By Drs. Fordyce, Balfour, and others, this practice has been condemned, and it is maintained by these gentlemen, that it produces the most decided advantages, when it produces the least sensible effects upon the Stomach. Nausea is so unpleasant a feeling that few patients will be found to submit to a repetition of the medicine which is sure to produce it, and if from the experience of these gentlemen, the Tart. Antimony is found to operate beneficially, without the actions of the Stomach being disturbed or nausea produced, it will be removing one of the most considerable objections towards its employment.

Did the sickened state of the patient, Dr. Chapman observes in his Therapeutics, operate in the beneficial way contended for, then the utility of the medicine should be proportioned to the effect thus created, and a variety of other nauseants, infinitely more powerful and lasting in their impressions, as the Digitalis, Tobacco, and Squills ought to be preferred. But this is contradicted by experience, and Tart. Antimony, will be found beneficial in proportion to the impression which it makes. This impression would seem to depend upon the power of the medicine in moderating the action of the heart and arteries, and upon the exercise of this power its good effects seem to depend. To such a degree is it exercised, that Dr. Balfour has not hesitated to attribute to it a sedative and febrifuge action, and this independent of the production of nausea.

Upon the principle of moderating the action of the heart and arteries, the Tart. Antimony, has been applied to other diseases, and especially the Phlegmasiæ. In Pneumonia, after depleting measures have been carried as far as the strength of the patient will admit, without subduing the disease, this medicine given in small doses so as not to excite nausea, or discontinued when it does, will be found efficacious in relieving pain, increasing the freedom of respiration, exciting perspiration, and subduing the remaining inflammatory symptoms, more effectually, and without further expenditure of the vital powers, than venæ sect, or the usual depleting measures. In these cases I have employed it with the utmost advantage, given in small doses frequently repeated, under the circumstances I have specified, and always with the happiest effects.

In Catarrhs, Chronic Coughs, employed at a proper period, there is no article which exercises a more salutary influence. By it an impression is exerted upon the disease infinitely to be preferred to that produced by mucilaginous drinks, cough mixtures, anodynes, &c. which are so often resorted to, and which are frequently so unavailing. These remedies allay present suffering,

while the morbid action still progresses. The Tart. Antimony strikes at the root of the evil.

In Phthisis Pulmonalis administered in the same manner, advantage is often derived. and I have known the cough allayed, sleep induced, and the distresses of the patient quieted when anodynes disagreed or failed in their effects.

The same practice is useful in Rheumatism, either chronic or acute, in cynanche tonsillaris, in hernia humoralis, in ophthalmia, in chronic hepatitis, and a variety of other inflammatory affections. The strength of the mixture to be employed is half a grain or less to the ounce of water, or two grains to  $\frac{3}{4}$  vi. of water, and a tablespoonful taken every two hours, or at longer intervals, according to circumstances. In none of these cases is it intended that the employment of the Tart. Antimony should set aside the usual depleting remedies, in the early stages of the disease, but when they have carried to a sufficient extent, the administration of small doses of this article will be found very advantageous.

Such is the practice which is usually pursued in the employment of this article.

Within a few years an entirely new course has been recommended in its administration. Rasori, an Italian, and the founder of the new Italian system of medicine called the counter stimulant, has given it in very large doses in diseases. It is necessary I should particularize the doses; the quantity would never be conceived of by you. He employed it to the extent of 20 grains to  $\mathfrak{z}$ i. in the twenty-four hours, without exciting repeated vomiting or excessive evacuations, as one would think probable, but on the contrary with the happiest effects. Under this free administration of the article, the Stomach and Intestinal Canal are affected as by its ordinary use, with vomiting and purging, the pulse softens in a remarkable manner, it becomes less frequent and less forcible, the cutaneous secretion is abundantly increased, insomuch that the skin is constantly moist and even wet, and inflammatory action in the lungs or other internal organ by this revulsive operation upon the surface, is speedily removed.

The same practice is pursued in inflammatory rheumatism, dropsies, &c. In some instances relief was obtained by the evacuations (when first used) from the stomach and bowels, and afterwards by the pores of the skin. In other instances, though large quantities had been taken, no evacuations followed, and under these circumstances, the good effects resulting, have been attributed to the impression which this medicine makes upon the system, allaying irritation, and lessening the excited action of the heart and arteries.

It may be proper to state the manner of exhibiting the Tart. Antimony and the effects which follow its use. Upon taking the



first dose of 3 or 4 grains in a tablespoonful of water, vomiting is excited several times, and often evacuations from the bowels. If in the course of two hours 3 or 4 grains more are administered, the discharges from the Stomach and bowels are not repeated, or very slightly so. At the expiration of the same period the same dose is repeated, until  $\mathfrak{v}$ i. or  $\mathfrak{v}$ ii. or more are taken in the 24 hours. After the first operation is over, the medicine is said not to distress the Stomach, but the effects which have been stated as arising from its influence upon the pulse, the skin, with the abatement of pain and inflammatory action. If nausea is not excited by these doses, continued every two or three hours, they are augmented, or the same diminished if it is produced.

The practice is thus continued from day to day. On the 4th or 5th day, the medicine is often rejected, the patient becoming nauseated by its use—it excites vomiting, and the use of the remedy can no longer be persisted in. In the mean time such changes are induced in the system, that the disease for which it was given, has sensibly yielded, or is entirely removed.

It should be observed that the diseases in which this medicine has been carried to such an extent, as pleuritis, pneumonia, rheumatism, &c., the intestinal canal has been in a sound state, and therefore the vital operations of the first passages, and of the system, could subdue the impression made upon them. If the mucous membrane was inflamed, or irritable, the effect in all probability would be different.

Upon this practice I can furnish no opinion derived from experience. The doses are so much larger than we have been accustomed to administer, that some anxiety, and even fear, would be felt, in employing it to the extent recommended. Where the state of excitement is great, larger doses of medicines will be required to produce an impression, and I have already cited the practice of Dr. Cartwright in the Pneumonia Biliosa of Natchez.

Administered however as I have mentioned, the practice does not seem very objectionable, and in this manner a patient may take in some cases of disease from  $\mathfrak{zss}$ . to  $\mathfrak{z}$ i. or  $\mathfrak{z}$ ii. of Tart. Antimony daily, the quantity we are assured actually administered by Carlo Botalli, one of the most distinguished physicians at Pavia.

Lastly the Tart. Antimony has been much resorted to in the chronic affections of the skin and superficial ulcerations. Desault recommends it to be given in small doses so as to affect the bowels, though to produce any decisive effects, it must be long and perseveringly employed. In Herpes, Lepra, it may also be found useful. It is given alone in minute doses, or combined with some other article which has a determination to the surface, as guaiacum or sarsaparilla.

Applied to the surface of the body, Tart. Antimony exerts an action which is somewhat specific. This consists in the production of a vesiculo-pustular eruption upon the skin, resembling in some degree the variolous, the pustules upon breaking discharge a good deal of matter, and a small ulcer succeeds which is slow in healing—the sensation produced in the part by the appearance of the pustules being compared to the continued presence of caustic. Thus a powerful and permanent stimulant action is excited, which has been taken advantage of in curing formidable and deep-seated affections. The efficacy of this application has been considered by the late Dr. Jenner in a dissertation on the influence of pustular eruptions in certain diseases incidental to the human body. Many obstinate chronic cases are detailed by him as cured by an application of the Tart. Emetic in the form of ointment. The diseases in which it was most successfully used were Mania, Hypochondriasis, Pulmonary affections, Rheumatism, Hooping cough, &c. In these cases, the ointment is rubbed over the diseased parts, or as near to the seat of the disease as is possible.

In Rheumatism especially, the application has been much employed, and it has been said to be a remedy of great efficacy. In recent cases the first or second application has often removed the complaint, but in those which occur, by far the most frequent are of long standing, in which it may often be necessary to persevere in the frictions for three or four weeks. Upon the eruption making its appearance it must be discontinued until the soreness is removed, when it may again be applied, with the effect of renewing the crop of pustules, and so on until a cure is effected.

In Phthisis Pulmonalis the application is made to the chest, and in Mania to the scalp. The connexion between cutaneous eruptions and internal diseases has not escaped the observation of many physicians, and I may even add the notice of unprofessional persons. Epilepsy, Mania, Delirium in Fever, Phthisis Pulmonalis, &c. have all been observed to be removed or excited by the recurrence or recession of cutaneous eruptions. The consent between the skin and lungs is particularly manifested in the effects of repelled itch, small-pox or measles, which seem to fall immediately upon the breast.—*Huxham*.

It is then from analogy, that the practice of exciting artificial cutaneous eruptions, in any of the above diseases is established, and the testimony of Jenner, a name which can only be uttered with reverence and gratitude, is strongly in support of its utility. Thus have we opened a wide field for observation, and the application of our remedies,—if any interest has been excited in the remarks which have been made, it will be renewed with infinite

pleasure and profit, by reading the very valuable paper of Dr. J. on the subject.

The ointment is directed to be made of the following strength, viz: Tartarized Antimony,  $\text{ʒi.}$ , Lard,  $\text{ʒi.}$  to be well mixed. This is to be applied by friction in the neighborhood of the part affected, and to the inside of the arms. The friction is continued once or twice a day, for two, three, or four days, according to the sensibility of the skin, when a crop of pustules takes place, and in many cases with great relief to the symptoms. The reason of the greater relief afforded by Tart. Antimony than by Cantharides is, that it not only vesicates, but it produces diseased action of the skin itself, by deeply deranging its structure, and in the ulceration extending beneath its surface.

Of the forms in which the Emetic Tartar, is exhibited.—It is readily dissolved in cold water, but more so in warm. The dose as an Emetic is from  $\text{ij.}$  to  $\text{v.}$  grains, and it is best given in divided doses, (as some persons are more readily affected by it than others,) at intervals of 10 or 15 minutes, until vomiting is excited.

Another form in which this medicine is employed, is dissolved in wine, constituting the well known preparation, the Antimonial wine of the Dispensatories. This was formerly made by dissolving the glass of Antimony in wine, but it was often found to be uncertain in its operation, the strength of the solution varying with the degree of acidity of the wine, its power being in proportion to the oxide which the tartaric acid of the wine dissolved. It is now prepared by dissolving  $\text{ʒii.}$  of Emetic Tartar in  $\text{ʒii.}$  of warm water, and adding to this  $\text{ʒviii.}$  of white wine. An ounce of the wine contains grains  $\text{iv.}$  of the Tartar and is a dose.

In preparing the Antimonial wine a considerable portion of insoluble matter is frequently observed in the bottom of the vessel, which upon examination proves to be Bi Tartrate of Potash and Tartrate of Lime. These precipitates are more abundant in the powder of Emetic Tartar, hence its greater cheapness than that purchased in the chrystallized form.

The Antimonial wine is a favorite preparation. It is often given to children, and is prescribed at a very early period of their existence, though in most cases I should prefer the Ipecacuanha. As it may sometimes be necessary, the following are the doses in which it should be administered. To infants at the birth, when it is given to relieve difficult respiration, the dose should not exceed one or two drops. At any period during the year, provided they have attained the age of three or four months, the dose for the purpose of vomiting is 10 to 15 drops, to be repeated at short intervals, according to the urgency of the case. In our employment of the Antimonials in the diseases of children, we cannot be too



cautious, as I have known the 32-100 part of a grain given to a child within the week to operate very powerfully.

Tart. Antimony used in the form of Enema, has been recommended by several physicians as a powerful remedy, and said to be applicable to a great diversity of cases.

From the relaxation produced by the action of this medicine upon the muscular fibres, not only of the bowels, but the whole system—injections with this article have been recommended in obstinate obstructed bowels, in bilious colics, and in other spasmodic diseases. In these cases, 8 or 10 grains of the Emetic Tartar dissolved in water may be used as an Enema, and it will in most cases succeed very well. If it does not, we have only to increase the quantity and repeat it in 30 minutes. I have never had occasion to make trial of this injection, but it is recommended by several physicians. By Dr. Chapman its use has been suggested in Tetanus, and for his reasoning upon the subject I will refer you to his Therapeutics.

Taken in an over dose into the Stomach, it excites the most alarming symptoms—they are incessant vomiting, cramps and pain in the Stomach, muscular contraction of the limbs, cold sweats, great prostration, &c. The remedies which should be employed in this state of the system, are flannels wrung out of hot vinegar, or spirits, to the epigastrium. If this does not succeed, laudanum must be resorted to—at first in moderate doses, repeated every 10 minutes, which may be increased to  $\mathfrak{z}\text{i}$ . or more, for it should be observed that pain modifies the operation of Narcotics upon the nervous system, so that large doses may be exhibited without any unpleasant consequences—cataplasms of mustard should be applied to the epigastrium, and if necessary to the extremities, the warm bath. In this irritable state of the Stomach, the drinks taken should be small in quantity, as any degree of distention produced by them will certainly renew the contractions of this organ and the expulsion of the article taken. To these may be added the infusions and decoctions of bitter and astringent vegetables. For instance, it has been observed that  $\mathfrak{z}\text{i}$ . of the decoction of yellow bark is capable of completely decomposing  $\mathfrak{z}\text{i}$ . of this salt, and of rendering it inert. Accordingly, its immediate exhibition has been recommended, when an over dose of this salt has been taken. An Infusion of Galls will have the same effect, and rhubarb is also an incompatible substance. The operation of these articles in decomposing the Antimonial salt is the following. All the substances possessed of astringent properties, contain gallic acid. This acid unites itself to the oxyde of Antimony, and forms with it a new compound, which has no Emetic properties;—Galate of Antimony.

I have thus concluded what was necessary to be said on the employment of Tart. Antimony. It is a preparation particularly valuable, and deserving your attention, and I cannot but consider it one of the most fortunate discoveries which Chemistry has added to the *Materia Medica*. It is unquestionably one of the most active and efficacious medicines which we possess, and were I to sum up its powers in a few words, I would say it was *ipse agmen*, a host within itself.

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*Sulphas Cupri—Sulphate of Copper.*—In continuation of the subject of Emetics, I shall speak of some other mineral preparations. Copper affords us several very powerful Emetics, but the only one in use is the Sulphate of Copper. It is obtained by evaporating waters which hold it in solution. Such waters are to be found in Copper Mines, where the Sulphuret of Copper, by exposure to air and moisture is converted into Sulphate. Sometimes it is produced artificially by calcining the native Sulphuret of Copper, and exposing it in a humid state to the air, the metal becomes oxidated, and the sulphur absorbing oxygen is converted into Sulphuric acid, and the Sulphate of Copper is formed. This is then dissolved and crystallized.

Copper in its metallic state exerts but little action upon the system. A remarkable case in illustration of this fact is related (by Dr. Paris) of a young woman who swallowed six copper pieces, with a view of destroying herself. She was attended for two years, by several physicians, for a disease which was considered visceral, but it was the effect of the mechanical obstruction occasioned by the coin. After some years had elapsed she voided them, and then confessed the cause of her protracted disease, during the whole of which, no symptom arose which could in any way be attributed to the poisonous influence of Copper. When poisoning occurs from Copper, it proceeds from the want of cleanliness in the use of Copper vessels, by which they are suffered to become coated with the green carbonate, but more frequently it happens from vinegar being allowed to stand in such vessels until verdigris is formed.

Sulphate of Copper is distinguished by the promptness and activity of its operation. In a large dose it has succeeded in expelling Narcotic substances, after other Emetics, particularly the Sulphate of Zinc, had been used without effect. In these cases where the irritability of the Stomach has been greatly impaired, and the patient nearly in a state of insensibility, it has produced instantaneous vomiting, when given to the extent of 10 or 15 grains dissolved in water. As it is sometimes very violent in its operation, even in small doses, it is not much employed in general practice. It may be beneficially employed in certain cases.

In Cynanche Trachealis it has been extolled as being more decidedly efficient and speedy in its operation than any other Emetic. From the insensibility which exists in the Stomach to impressions in some of the stages of this disease, I should suppose it a remedy well adapted to these cases, and that it may with great propriety be resorted to, after milder means have failed of producing Emesis. By a German practitioner\* it has been recommended as an excellent remedy in this disease, especially after V. S. In slight cases he begins with giving from a quarter to half a grain every two hours. In those cases, however, where there is much stridulous breathing, denoting inflammation of the larynx or bronchia, 3, 4 or more grains are administered, to excite vomiting. By so doing, the lymph is not only expelled from the trachea, but also the further secretion of it is prevented, so that the patient is much relieved and even cured. After copious vomiting has been produced, the medicine is to be given in small doses in conjunction with Digitalis. In support of the utility of this practice, it is affirmed it has been employed with the greatest success, during a period of ten years, in a great number of children affected with croup, without losing a single patient in that time, notwithstanding the disease was often at its height when first called. This is certainly speaking of the remedy in very strong terms, and the practice pursued is worthy of your attention. Such is the relief afforded by frequent and free discharges from the Stomach, and such the power of Emetics in producing new determinations of the circulating fluids, that their value cannot be too highly appreciated.

Upon this article I need not dwell very long, it does not exert any very considerable curative operation, neither do I know of its being applied to any case in which the Tart. Antimony or other preparation may not be used with infinitely more advantage. Some physicians are partial to it as an evacuant of the Stomach, and as it is conveniently administered in the form of pill for this purpose, it might on some occasions be found useful.

Besides, its Emetic properties the Sulphate of Copper, may be so exhibited as to prove a valuable tonic. In minute doses as the quarter or eighth of a grain, it has been employed as a useful auxiliary to bark, in the management of obstinate and protracted Intermittents.

As an Escharotic it is well known, a weak solution being employed as a wash for indolent and foul ulcers.

The dose of the Sulphate of Copper, as an Emetic, is from ij. to v. grs.

*Poisoning from the Salts of Copper.*—This is not a very common occurrence, in consequence of the great care taken in the use of

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\* Dr. Hoffman.



copper vessels, and the general knowledge which exists upon the cautions to be observed. They may, however, be taken either accidentally or by design,

The symptoms excited are the same as those produced by arsenic, or corrosive sublimate:—violent colic pains, vomiting and purging, the eructation of a matter containing verdigris, sometimes salivation, a small pulse, and blueness about the eyes, jaundice, a copper taste in the mouth.

*Morbid appearances.*—Chiefly signs of inflammation. The Stomach is of a green colour, its inner coat excessively inflamed. Ulceration, and the contents of the Stomach to be found in the sac of the peritoneum.

*Treatment.*—After experiments with various substances, Orfila has ascertained that the best is Albumen.

Operation of Albumen on the Salts of Copper—Has the property of precipitating solutions of Coppery Salts, reducing them to the state of an oxyde, and of forming an insoluble compound with the oxyde.

Sugar is recommended as superior to Albumen.

The efficacy of sugar in counteracting the poisonous effects of Copper is confirmed by the practice of Fishermen in the West Indies. At certain seasons in the spring and summer, the eating of certain kinds of fish is extremely dangerous, the symptoms produced being those of a very violent character, such as attend the most virulent poisons. Various causes have been assigned respecting this poison. The opinion entertained very generally is, that the sea impregnated with Copper renders the fish poisonous. To counteract the poison of the fish, the juice of the sugar cane has been found very effectual. So perfectly are the fishermen convinced of the fact, that they never hesitate to eat of the suspected fish, provided they can procure the juice of the sugar cane—they bruise the cane between two stones, and express the juice, which they immediately drink, without further preparation.—*Sigmonds's Lectures.*

The operation of Sugar upon the Salts of Copper, is to reduce them to the state of a Protoxide.

*Sulphas Zinci—Sulphate of Zinc.*—Zinc is another of the metals from which we obtain a valuable Emetic preparation. It is found in combination with different minerals, in various parts of the world, in England, Hungary, Germany, usually united with Sulphur, forming the ore called *blende*, which is a Sulphuret of Zinc.

Sulphuret of Zinc found native, is of a dark or black colour, confusedly crystallized. It has some resemblance to the Sulphuret of Lead, but is distinguishable from it by several characters,

particularly its less shining and metallic surface, and its greater hardness. In its metallic state it exerts no sensible action upon the system, and to be rendered active, it undergoes certain chemical changes, by which it acquires different degrees of activity.

The preparation to which I shall call your attention is the Sulphate of Zinc. It may be prepared by the immediate union of its principles, by dissolving Zinc in Sulphuric Acid diluted with water. But most of the White Vitriol of commerce is obtained by exposure of the Sulphuret of Zinc to air and moisture. The metal thus becomes oxidized and the Sulphur acidified, and by mutual action a Sulphate of Zinc is formed. *It is in the form of white masses grained like sugar, often spotted with yellow.* It has a very strong acrid, styptic, metallic taste, and is soluble in twice its weight of water. In this state it is not a pure article, but contains Sulphate of Iron, and sometimes Sulphate of Copper. The Sulphate of Zinc is separated from these, by dissolving it in water, boiling it with the oxyd of Zinc, which precipitates the Iron and Copper—the solution is then evaporated and crystallized.

This is the only Emetic preparation, and it is not commonly employed in cases in which an Emetic is indicated, but it is especially had recourse to as it operates speedily and with much force in cases where it is of importance that the contents of the Stomach should be immediately evacuated, as when poisons have been taken. The dose under such circumstances is from 20 to 40 grains, but in ordinary cases, 10 or 15 grains repeated until vomiting is excited are sufficient. Possessing no advantages over other Emetics, and being extremely harsh and unpleasant to the taste, its use was limited to few diseases, until Dr. Moseley, a distinguished writer on the diseases of the West Indies, introduced it into notice. By him it was extolled as an Emetic, in the highest terms, and the language he employs is more that of an enthusiast than an experienced practical physician. As an Emetic, he says that it is in all respects safe and innocent, possessing advantages over all other nauseating and Emetic substances whatever, which are that the patient is not harrassed with its operation, for that it is never violent, generally instantaneous, and as suddenly over, always leaving the Stomach invigorated. Neither, says he, does it prodnce spasms in the bowels, nor any nervous affection.

It is the basis of the preparation known by the name of Moseley's Vitriolic Solution, and as this is the form in which it is applied to diseases, the following is the mode of its preparation.

R. White Vitriol, ʒiii.	} Let them be mixed in a mortar. The
Alum, ʒi.	
Cochineal, grains. iij.	
Water, ʒbi.	

cochineal is first to be rubbed fine, and the alum and vitriol are then to be added and triturated. The water is to be poured on, and the whole set by to settle.

In this solution the proportion of either the vitriol or the alum, may be augmented or diminished according to circumstances, that is, when evacuations are required, the quantity of alum may be diminished, or even entirely omitted,—and when great astringency is required the quantity of alum is to be increased and the vitriol to be diminished. The dose is from a tablespoonful to a teaspoonful, according to the age and strength of the patient, which is to be taken every morning, fasting, in some cases to be repeated every six hours. The solution is very unpleasant to the taste, but it cannot be improved in this respect, at least without impairing its virtues.

The vitriolic solution has been applied by Dr. Moseley to several forms of Intestinal disease. In Dysenteries, Diarrhœas of long standing, in Colica Pictonum. In Pulmonic affections, when respiration is performed with difficulty, and when expectoration is to be promoted, as in catarrhal coughs and hooping coughs, in Phthisis Pulmonalis, &c., in all of which it has been recommended in the highest terms.

The Vitriolic Solution, to the best of my knowledge, is not much employed in this country, and I do not recollect having used it. The diseases in which it has been employed, having been found to yield in most cases, to other forms of practice. I wish not, however, to say any thing which may discourage you hereafter from making trials with it yourselves. Fashion, be assured, exercises its influence even in our department, and because an article is not in vogue its merits are overlooked. Such, however, is the diversity of organization, temperament, and condition of the human frame, that a variety of remedies is often called for; what has succeeded in one case has no effect in another. You should therefore be made acquainted with the diversities of practice suited to the same disease; hereafter convenience, necessity, and more particularly the pathology of the complaint, may direct your choice. Operating as this medicine commonly does, as a mild nauseative and Emetic preparation, it may be considered well suited by these effects to the management of the several diseases I have mentioned. For further particulars in the employment of the Solution, I refer you to the work of Dr. Moseley, on the Diseases of Tropical Climates.

The Sulphate of Zinc. has been recommended in cases of Angina Pectoris. In this disease when the peculiar and characteristic symptoms have existed in a very strong degree, and after the usual remedies were unsuccessfully employed, recourse has been had to this medicine, and it is said with very good effects. It is given in small doses as a grain morning and evening, with a quarter of a grain of opium at bed-time, increasing the quantity as the Stomach will bear it. The dose may be increased to two



and a half grains, and several cases are related, as restored by this medicine.

With the nature of this complaint, many of you are probably well acquainted. It consists in an organic derangement of the heart, either of its valves or arteries, or of some irritation of the cardiac nerves, giving rise to pain. Originating in such causes, it is not probable that a few grains of this substance will exercise much influence on the disease, neither should it be depended upon. Other means more effectual should be kept in view, as blood-letting, diet, rest, counter-irritants, and it is only after they have been effectually tried, can any advantage be expected from the Sulphate of Zinc. From the utility of Emetics in some diseases of the Thorax, this article has been employed in Asthma, Pertussis, &c. Emetics are useful in these cases by retarding the approach of the paroxysm, promoting free expectoration, and producing a determination towards the surface. It is on this account that Ipecacuanha and Squills have stood foremost in the list of remedies for these diseases, a considerable time, and this undoubtedly from the good effects observed from their nauseating and Emetic operation. By some practitioners the White Vitriol is preferred to these medicines, not only as it affords relief by its Emetic operation, but being also antispasmodic.

A brief consideration of the Pathology of Asthma will render the benefits to be derived from Emetics more striking. The immediate cause of the distressing symptoms experienced, is attributed to a spasmodic affection of the bronchia, or a morbid thickening of the mucous membrane lining the bronchia, such as occurs in coryza, or cold in the head as it is termed, the nostrils being stopped up as it were, from the thickening of this membrane. The consequence of this state of the parts, is an obstruction to the free ingress and egress of the air in respiration. The air being obstructed in its free passage into and out of the lungs, expectoration cannot be performed, or only with difficulty. The mucous secreted by the bronchial passages being retained, adds much to the embarrassment of the breathing.

The freedom of action in the lungs being interrupted, the blood circulates with difficulty, it is accumulated in the lungs, and adds to the existing distresses of the patient. The functions of the lungs are imperfectly performed, hence the lividness of the lips, face, and of the ends of the fingers, the coldness of the surface, &c. The point from which this train of evil proceeds is that state of the solids giving rise to the production of spasm. Emetics then by their impression upon the system and the production of nausea, favor relaxation of the muscular fibre, the air in the lungs being variously agitated, during the action of vomiting expectoration is promoted, and the fluids of the body by the diver-

sion given to them, are directed from the internal to the external parts of the body. Thus the congestion of the lungs being relieved, their functions are better performed. Of the several Emetics which by occasioning vomiting, effect these salutary objects, the White Vitriol has been recommended, since it has been supposed to exert in addition an antispasmodic operation. This opinion, though supported by Akenside, is not confirmed by practice, and in my employment of this article I have not experienced greater advantages from its use than from any other Emetic.

## DIVISION II.

### *Medicines which irritate the internal surface of the Alimentary Canal.*

#### CATHARTICS.

This division of the *Materia Medica* is probably the most useful and important of any which will engage our attention. It is more extensively applicable to diseases, is resorted to on a greater variety of occasions, and is of very essential benefit in controlling and subduing the morbid operations of the system. On this account I will enter particularly into the consideration of the effects and operations of this class of medicines.

To form a just idea of the operation of Cathartics, it will be necessary to consider with a little particularity the effects which follow their administration.\* As soon as they are exhibited, the appetite and all desire for nourishment is destroyed, nausea succeeds, and uneasiness is experienced in the Stomach, which is occasionally increased to a considerable extent, with a sensation of heat and restlessness. As they proceed down the intestinal canal, the action of this organ is increased, a rumbling motion is frequently felt, and the abdomen has an uneasy sensation of distention.

The pulse is small and irregular at this period, and other symptoms denoting a disturbed state of the system generally, as frequent heats and chills, the skin dry, with an increase of the animal temperature. These symptoms are relieved by the evacuations taking place, which are repeated in an intermediate number of times, and which present considerable varieties in quality and quantity.

The effects described will vary according to the nature and activity of the purgative employed, sometimes much distress is excited, and at others little is felt.

In explanation of these effects it will readily be perceived that they have their origin in the action of the Cathartic upon the surface of the Intestinal Canal, and that most of the phenomena exci-

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\* Vide Barbier, *Traite Elementaire*.

ted, are derived from the impression of these substances upon this surface. It will also be perceived that there are certain general symptoms produced, which prove that this impression is extended to all parts of the system. Cathartics, therefore, exercise a *local* and a *general* action. I shall offer some remarks upon each, but before I proceed it may be useful to take a cursory view of the structure of the Alimentary Canal, as it is from the consideration of its various functions that we are made particularly sensible of the benefits conferred by these medicines.

The Internal surface of the Intestinal Canal, is lined by a delicate membrane thickly studded with small follicles, which secrete a viscid mucus, and from this circumstance has been called a mucus membrane. To the Intestines there is sent a liberal supply of blood vessels which penetrate into their texture, and are distributed in an infinite number of minute ramifications. These vessels become very apparent upon any irritating substance being applied to them, they become red as if injected, and from them is poured out an abundant supply of serous fluids. To the fluids derived from these sources must be added those derived from the glands, as the liver, and pancreas, which have their ducts opening in the duodenum, along which irritating impressions are conveyed to their respective glands, giving to their secretory functions increased activity.

Exterior to the mucus membrane there exists a muscular coat formed of circular and longitudinal fibres. It is this coat which occasions the vermicular motion with which the Intestines are animated. Excited by the action of Cathartics, these fibres have their contractions increased, the peristaltic motions become quickened, and the contents of the bowels are urged on with some degree of rapidity to the rectum.

That Cathartics operate by a local impression upon these parts, and that it is of an irritating nature, hardly requires to be proved. It is however illustrated very fully when those of a drastic character have been exhibited. It is then shown that the action which is excited is of an inflammatory nature, the dejections become bloody, with distressing griping pains, the abdomen is tender to the touch, and if the texture of the Canal is deranged death ensues.

Orfila has proved that many natural productions, which are employed as Cathartic medicines, are capable of inflaming the Intestines of animals to which they have been exhibited, and that they cause injuries similar to those of the more acknowledged poisons. The irritation, however, which is necessary to excite a Cathartic operation is not of such intensity, and does not excite such distressing symptoms. It is an irritation, moderate and gentle in its effects, and a cathartic agent is one endued with the faculty of exciting this particular action.



The *effects* therefore or the physiological phenomena which follow the administration of a Cathartic medicine, are an increase of all the vital energies of the Alimentary Canal. The capillary vessels which form a net work, become more apparent and distended with blood, and the serous exhalation which in a natural state moistens the interior of the Intestinal Canal, is excited to a more copious secretion. The mucus follicles which are spread over the surface become very active, and furnish in a short time a very abundant discharge. The action of the Purgative does not cease here, but the several ducts which terminate in the Duodenum have this action extended to their organs, and they are excited to pour out their fluids **more freely**.

While these operations are progressing, the muscular fibres of the Intestines are also stimulated, and the peristaltic motion increased, by which their contents are quickly propelled and discharged.

From this view of the operation of Cathartic medicines it must be obvious how important is the subject upon which we are engaged and how extensive is the application to diseases. In diseases where plethora is to be removed, and the preternaturally increased action of the vascular system diminished, Cathartics next to venæ sect. may be considered as the most prompt and powerful means we can employ.

They are valuable in another point of view.

By their stimulant action exerted upon the several parts I have mentioned, they not only are evacuants, but they act powerfully in equalizing the circulation. The essential principle of disease is unequal excitement, and too great an accumulation of fluids in one part of the system at the expense of the other. Our duty is to rectify this state of the circulating system. Cathartics are, for this purpose, our best remedies, inasmuch as by evacuating one set of vessels, an afflux of fluids is determined to these parts, and relief is afforded to other parts of the system. Hence their utility in diseases of the head, the determination of the fluids in the vessels of the abdomen which supply the intestines, being increased by purging, the quantity and impetus of the blood, in the vessels of that part of the system, are proportionally diminished.

The degree in which these effects are produced, are influenced by the nature of the article which we employ, hence this class has been divided into *Eccoprotics*, *Drastics*, and *Hyper-cathartics*. This division I consider objectionable, because the two last are converted into each other by an increase or diminution of the dose.

The simplest arrangement is into Laxatives and Purgatives.

By Laxatives is meant such substances as operate mildly without exciting any general affection of the system, without stimulating in any great degree the vessels of the Intestines, and hence they merely evacuate the contents of the canal.

Purgatives are more stimulating, they occasion an influx of fluids from the exhalent vessels, and from the neighboring secretory organs; they even extend their stimulating effect to the system in general, and if taken in too large a dose excite much irritation, and even inflammation upon the surface of the Intestines.

In both of these divisions, the articles which produce these effects may be considered as substances which resist the digestive process, or whose nature the gastric juice cannot change, which irritate the surface of the Intestines, and afford nothing to be acted upon: they become therefore medicines by compelling the bowels to revolt, if I may so say, upon what they cannot overcome.

Besides these differences which arise from different degrees of activity, Cathartics will present other varieties in their modes of operation, according to the part of the Alimentary Canal upon which their action is directed.

This difference will probably be connected with the nature of the article itself, and will depend upon the peculiarity of its stimulus, or the readiness with which it undergoes solution in the bowels. Dr. Paris has so well expressed the idea I wish to convey, that I shall avail myself of his language. It is easy to conceive that a medicine may act more immediately and especially upon the Stomach, small or large Intestines, according to the relative facility with which its principles of activity enter into solution. That those which are dissolved before they pass the Pylorus, are quick and violent in their effects, and liable to affect the Stomach, as gamboge, while some resinous purgatives on the other hand, as they contain principles less soluble, seldom act until they have passed out of the Stomach, and often not until they have reached the colon; while others still less soluble have their action upon the rectum. These views will be best illustrated by examples of medicines, which have an influence upon different parts of the Intestinal Canal.

Calomel for instance operates upon the upper portion of the Intestinal Canal, as exhibited in the biliary evacuations which follow its use. Gamboge when given alone, on account of its ready solubility, has its action upon the same portion of the Canal, hence it sometimes, as well as Calomel, exerts an Emetic operation. Jalap and many other Cathartics have an action upon the small as well as large Intestines, and aloes and hellebore pass through them, and have their action principally upon the colon and rectum. This want of activity, would seem to be connected with the slowness with which it undergoes solution. In short those substances we have called Emetics, seem also to owe the peculiar effects which follow their use in having their operation upon a portion of the Alimentary Canal still higher, viz: the Stomach.

Cathartics differing in the degree of their action or irritation, as well as the parts of the Intestinal Canal upon which they operate, it follows of course that the evacuations produced by their use will be different. Some will simply remove the contents of the bowels, others will produce an increased discharge of bile, while others by stimulating the exhalents particularly, will produce an increased secretion from these vessels, and a discharge of watery passages.

The qualities of the evacuations being different according to the purgative employed; it becomes necessary to give some explanation of certain terms which have been much employed in Therapeutics.

From a consideration of the different qualities of the evacuations, the ancients applied to particular articles specific powers, and hence employed certain expressions to designate them, these were Hydragogues, Cholagogues, Phlegmagogues, &c., or medicines capable of causing a discharge of water, bile, phlegm. The idea which was attached to the term Hydragogues, was not such as I have explained, as medicines which had the power of augmenting the exhalation of the Intestines, but they were considered as remedies which had the faculty of removing by a special virtue, a morbid serum which existed in the system of the sick, and which was to be expelled downwards. The Cholagogues they conceived searched out in the body of the patient, bile which was depraved, which had fixed itself upon organs essential to life, which caused pains, and which supported the fever. These evacuants expelled the humor, and health was restored. The Phlegmagogues carried back to the secretories of the Intestines a pituitous matter which had been thrown upon the lungs, head, &c.

These terms originating in erroneous views of pathology, and the operations of medicines, are yet supported by actual appearances. All that we would understand by them however, is, that certain purgative substances have a tendency to act more upon one part of the Intestinal Canal than upon another, and in consequence of this determination the appearance of the evacuations are different. Upon what this peculiarity in the action of Cathartics depends, our experience is not sufficiently extended to determine.

My remarks have hitherto been confined to the action of Cathartics upon the surface of the Intestinal Canal, and the consequences which result from their irritation.

I now proceed to consider the effects of their operation upon the system generally.

An attentive consideration of what passes in the system, while under the operation of a Cathartic, exhibits important changes upon parts distant from the Alimentary Canal.



These general effects may depend upon the particles of the purgative substance being absorbed and carried into the circulation, but it is principally to the connexion which the surface of the Intestinal Canal maintains with other parts of the system.

It is known that Cathartics have considerable influence upon the pulse. The pulse during and after the operation of a Cathartic is smaller and more frequent than in health, and when spasmodic pains arise commonly denominated Cramps, it, also becomes unequal and intermittent.

The secretions are materially deranged, while some, those at least emptying into the Intestinal Canal are increased, others as the urine and perspiration are diminished.

The animal functions experience a like disturbance—muscular motion is impaired—the sensations appear vague and imperfect—the intellectual functions are slow and difficult—the inclination to sleep is irresistible. We ought to attribute to irritation of the Intestines, many of these symptoms, to regard the thirst as resulting from the intestinal excitement of the purgative, the cramps as the effect of the impression made upon the nerves of the Intestines, and extended to those of the legs—the feebleness of the function of perspiration as resulting from a diversion of the cutaneous excitement, and an increase of that *primæ viæ*. The sleep which attends purgation often appears itself caused by the increased determination which takes place to the digestive system, resembling that which accompanies the process of digestion.

The degree in which these effects will be experienced, will be influenced by the character of the article employed. When of a drastic nature, all these effects will be experienced in the individual case, and the system will not only be slow in returning to the usual exercise of its healthy functions, but a degree of enteritis may be produced which will give rise in its turn to other and characteristic phenomena. When the article employed is of a mild nature, the system soon returns to the normal exercise of its functions,—perspiration and urine are renewed, the pulse becomes more vigorous and strong, the desire for nourishment is restored.

Such are the circumstances most worthy of consideration in treating of the operation of this valuable class of medicines, and upon which we are led to reflect upon their utility, not only as depleting remedies, but as exerting new changes in the system at large.

Operating thus extensively they are highly useful in those states of the system attended with much excitement, but their employment has been objected to in diseases attended with debility.

You have been informed that purgatives are depleting remedies, that they act by increasing the secretions of the bowels, and in

their operation hurry off the chyle so as to preclude its entering the circulation. From these considerations they ought to be used with caution in cases attended with much debility, but they ought not to be rejected altogether, because by their use the bowels are urged to expel their contents, by which their functions are in some degree restored, the appetite and digestion are too often improved thereby, and the patient so far from being weakened is placed in a condition to be nourished and strengthened.

Cathartics have been objected to in diseases of some continuance, and in debilitated cases from another consideration. It has been said that as in such states but little food is taken, there can be but little occasion for regular alvine discharges, neither ought they to be expected.

In all diseases, however, it should be observed, that some portion of nourishment is taken, which will contribute to the formation of feculent matter. Yet in Fevers another supply is derived, not only from the abundant secretion of different organs, but from the excrementitious fluids which are poured into the Intestines. Under these circumstances it is easy to perceive the importance of attending to the condition of the bowels, since independently of solid matter being taken into the Stomach, feces are formed, which from the heat of the body, soon become acrid and irritating, and thus render the necessity of attending to the state of the primæ viæ extremely apparent.

Before proceeding to the application of this class to diseases, I shall in a very condensed manner, speak of the general objects accomplished by these medicines, as you will then be satisfied of their influence upon the animal economy, and of the great aid they afford in the practice of physic.

1. In the first place they serve to evacuate the Intestines, and to carry out of the system the substances they contain. It is hardly necessary to point out the importance of this operation. In a state of health, its interruption deranges considerably the exercise of the digestive functions, occasioning pain in the head, oppression, general uneasiness, &c. In disease it is still more necessary that the first passages should not retain for any time, their feculent contents, nor the excretions poured into them from various organs. For these substances by being confined in the bowels lose their natural qualities, they excite much irritation, and give rise to various distressing affections.

2. In the second place, the irritation which these medicines excite upon the internal surface of the Intestinal Canal, augments the secretory action of the liver, pancreas, mucous follicles, and at the same time a considerable discharge of serous fluid. From these several sources, the abdominal viscera are relieved from that tur-

gescence of the vessels which has been called congestion, and the good effects of which are seen in a number of diseases.

3. In the third place, the vital forces are determined during their operation towards the abdomen, the blood circulates with more activity in these organs, there is more warmth, and more sensibility than under ordinary circumstances.

The great afflux of fluids towards these parts, exercises a derivative or revulsive action in regard to the head, the chest, and other parts of the body, and thus it is that a very salutary influence is frequently exercised.

4. In the fourth place, the strong impression made upon the nerves, expended upon the surface of the Intestinal Canal, is extended by means of the great sympathetic, to the brain, the spinal marrow, and by a necessary consequence to all parts of the body. It is to this operation that we are to attribute very frequently the important results produced by these medicines—the actions often excited in remote parts—the alterations which take place in the secretions—the renewal of action—the change in short which the whole system undergoes.

Lastly. The impression which these medicines make upon the organic tissues, when their administration is not followed by alvine evacuations, but when their particles are absorbed ought also to be taken into consideration.

These diversified operations entitle this class to be considered as Alterative medicines of great efficacy, and fully illustrate the very necessary aid they afford, in diseases of almost every description.

#### *Rules for the administration of Cathartics.*

A few rules upon the administration of Cathartics will close what I have to say upon their general operation.

1. Cathartic medicines should be exhibited late at night or early in the morning, when circumstances are not very urgent. It would seem that during sleep the bowels are not so irritable, and consequently not so easily acted upon, while by suspending the influence of the imagination it renders it less liable to be rejected.

2. In cases of Fever where it is necessary to consult the quiet and ease of the patient, it is important that the exhibition of Cathartic medicines should be so timed, that their effects may be expected during the day.

3. Cathartic medicines should be exhibited upon an empty stomach, as we prevent their being rejected, and secure a more easy and effectual operation.

4. To promote the action of these remedies, as well as to obviate griping, warm diluents are to be freely taken after the first discharges, as chicken water, gruel, tea, &c.



*Practical application of Cathartics.*

The application of this class of medicines is so general, that I cannot state a case of derangement of health, in which they may not be employed with some advantage.

The Intestinal Canal is subject to so many irregularities of combination and action—its sympathies are so numerous and extensive—its functions so various and complicated, that the necessity frequently recurs of attending to its state and condition. It is, I may say, the sewer of the system, into which all the useless, foreign, and putrescible materials are collected, into which the fluids of the body after having served their offices, and the excretions of the several glands, are emptied.

From all these sources, it becomes engaged either in the production of disease, or instrumental in keeping up its activity. My time will only allow me to speak of the most important diseases in which they are used, and I can only dwell upon them in a cursory manner.

In Fevers of every variety they are indicated.

In these cases, they operate as evacuants and remove the remote causes, when they depend upon vitiated matter in the bowels.

In Fevers, the action of the bowels is always diminished, from which a state of fullness, restlessness, and anxiety is produced, which serve to aggravate the symptoms—Cathartics relieve this condition of the system, diminish and equalize arterial action, and stimulate the exhalents. They are useful in every stage of Fever—Given in the Incipient stage, they not unfrequently check its progress—during the course of the Fever, they relieve symptoms, and so far from diminishing, often increases the strength of the patient.

In Intermittents they are much used. In the early stage advantage is gained from Emetics, but Cathartics are also useful.

In Remittents they are equally useful, and more frequently necessary. They are employed daily to evacuate the bilious matter, and to bring down the force of the arterial system. The secretions are in almost every case of Fever changed from a natural and healthy state, to a condition which renders them additional causes of irritation to the already excited system. Cathartics therefore become necessary and important throughout the whole course nearly of all acute diseases, for the purpose of removing these additional supporters of Fevers.

In our highly bilious grades of Fevers, and in Yellow Fever, they are invaluable.

To any one who considers the increased quantity and the vitiated quality of the Intestinal Secretions in these Fevers, the necessity of immediately discharging them, will be sufficiently obvious;

and accordingly most physicians are anxious to excite discharges from the bowels as soon as possible.

These matters are often so acrid as to excoriate the rectum, and the skin immediately surrounding the part. Proofs are not wanting of this extreme acrimony in these cases, and instances must be familiar to most physicians. Dr. Physick's hand was inflamed by the acrid matter found in the gall of bladder, and the *primæ viæ*, in dissections made in the Yellow Fever of Philadelphia, in 1793.

Not only in these Fevers is the utility of Carhartics established, but even in Typhus, or the weaker forms of Fever.

To Dr. Hamilton the medical community is indebted for the important advantages to be derived from regular alvine discharges in this disease.

The presence of Typhus is marked by the following symptoms, (Hamilton,) viz., loss of appetite, thirst, sickness, white or loaded tongue, disagreeable taste of the mouth, and most commonly by constipation of the bowels. To these succeed langour, headache, debility, and inaptitude for the usual mental and bodily exertions—morbid affections of the surface of the body, of the sanguiferous system, and of the different secretions soon succeed, to which in the advanced stage are added delirium, subsultus tendinum, and singultus.

The treatment consisted of weak antimonials preceded by an Emetic and purgative in the commencement of the disease—but the condition of the bowels was little regarded in the after periods of the disease. The results of this treatment are extremely unsatisfactory, and upon having recourse to a stronger antimonial preparation, Dr. H. was soon convinced that its good effects were commensurate with its operation upon the bowels. The feces were generally black and fetid, and in proportion as they were discharged the low delirium, tremor, and subsultus tendinum which had prevailed, were abated, the tongue which had been dry and furred, became moister and cleaner, and the creeping pulse acquired a firmer beat.

The practice now adopted is the rejection of Emetics and glysters in this Fever, while reliance is placed upon Purgative medicines for the purpose of ensuring regular alvine discharges. With this view Dr. H. prescribes active doses of medicine, and gives them every other day. Since adopting this practice, we are assured that there is less need for stimulants in the treatment of this disease, and that it is much more manageable. The practice became general in England and even upon the continent—but in the United States the Typhus gravior and mitior of Cullen, rarely occurs, so that the efficacy of the practice recommended is seldom tested.

The importance of the principle should still be kept in view, and even in the low forms of disease, the necessity of attending to the condition of the bowels should never be overlooked.

In advocating the utility of Cathartics in Febrile diseases, it is proper to state to you, and even to admonish you, that in many instances they are abused or injudiciously employed. The remarks that I can make, must of necessity be very limited—practical views will be fully unfolded to you from another quarter—to me, alone, belongs the Therapeutical applications of Medicines, and the cautions to be observed.

I. Cathartic Medicines, then, are abused, or injudiciously employed when active or drastic articles are continued after the stercoraceous and acrid secretions of the bowels are discharged.—Under these circumstances, with the contents of the bowels, the the mucous secretion, which lines and protects the tender surface of the internal membrane, has also been removed; and the continuance of active articles can have no other effect than to wound and irritate this surface, to excite griping and distressing pains, followed by a frequent desire to evacuate the bowels—with small, thin, serous passages, attended with a painful and distressing tenesmus. The stercoraceous and offensive secretions from the bowels being removed without subduing the disease—it will be proper to discontinue these medicines, and excite some other secretion into action. When further evacuations are required, it will be advisable to excite them *by milder preparations*, as they will most commonly be found better adapted to the condition of the vital powers, and fully capable of carrying off the secretions which have been poured into the Intestinal Canal. I could depict to you the bad effects of a contrary practice, and have seen patients suffering under all the symptoms I have mentioned, the passages consisting of little else than thin serous discharges, with flakes of mucous floating in the fluid. The continuance of these medicines, under these circumstances, not only irritates the mucus surface to a considerable extent, but I will not go too far in stating, that instead of subduing, will be found to increase the Fever. You would hardly credit me were I to relate the extent to which I have known cathartic medicines pursued in febrile affections of an acute character. I have known from twenty to thirty evacuations excited from the bowels in twenty-four hours, not only from adults but in children. This practice is entirely wrong, it is absolutely destructive. You might almost question how such a number could be produced. The fact is undeniable, and it is adduced to show the pernicious extent to which these medicines are carried, and against which I warn you. These successive discharges are procured, not by two or three doses of active medicines, which are proper enough in the commencement of diseases, but by a continuance



of the same medicine every two or three hours, for twenty-four, thirty six or forty-eight hours, and sometimes the whole course of the Fever. However excited, whether by Calomel alone, or its combinations, whether Jalap and its combinations, or whether simply eleaginous articles, the practice is to be deprecated in the highest degree. I should be glad, if it were possible to give you definite rules on this subject. I can only state to you what has usually been my course.

It is, when called to a patient laboring under acute disease, to remove as much as possible all apparent sources of irritation. If necessary, venæsection is practised, if not, the condition of the Alimentary Canal, as affording many sources of irritation, and having a more extensive influence upon the system than any other channel, is attended to. The stercoraceous and offensive contents of the bowels being removed, which is commonly done with half a dozen evacuations, with the continuance of the disease, I attempt the renewal of some other secretion—the skin, or urinary organs, and combat symptoms as they arise. When the condition of the bowels requires attention, which will be in twenty-four, or thirty-six, or forty-eight hours, to excite discharges by the same medicines, if it can be borne, and if not, by a milder article, always keeping the same object in view, a renewal of secretion, or a change of secretion, and combating symptoms as they arise. The resources of the *Materia Medica* are quite sufficient in by far the greater number of cases, if we only apply them properly, judiciously, cautiously. You will hear various and contradictory opinions as to the means by which this is to be accomplished—listen to them all and judge for yourselves. Having found a mixture of error and truth to exist in systems and doctrines, I take advantage of the fact, judge for myself, and pursue an eclectic course.

II. Drastic or irritating Cathartics are injudiciously, nay, improperly employed, in diseases attended with an inflammatory condition of the mucous membrane of the alimentary canal.—When speaking of the physiological operation of these articles upon this surface, the remarks then made will render it unnecessary to enter into details—it is evident that they will exasperate all the symptoms. While on the contrary, from the milder articles, the most beneficial consequences must result.

It seems to me, that in a subject of such importance, it might be advisable to particularize some examples in Febrile diseases in which the precautions I have mentioned should be observed, as well as the symptoms which lead to a knowledge of this inflammatory state.

Without entering into the disputed question, whether Febrile diseases originate in an inflamed condition of the mucous mem-

brane of Alimentary Canal or not, I shall only observe to you, that Febrile diseases are often attended with a considerable determination to the abdominal viscera, and among the organs affected, the Stomach and Intestinal Canal, frequently participate largely in these determinations.

The symptoms which characterise this condition of these organs, are nausea, irritable stomach, vomiting of fluids taken, pain upon pressure, costiveness. When to these are added redness of the tongue, either pervading the whole surface, or confined to the edges or tip, or when with this state, it is coated with a thick fur,—when thirst exists, and the pulse ranges from ninety to a hundred pulsations in the minute, we may be assured that abdominal inflammation exists, and under these circumstances, active medicine of an Emetic or Cathartic character will be improper. Depletion by the lancet, should be preferred, until these symptoms are abated, fomentations to the abdomen, warm clothes, and the mildest medicines employed—calomel, for instance, followed by castor oil—Evacuations from the bowels being effected by this course, the utmost relief will be afforded, and the patient will have reason to rejoice in the prudence, judgment, and discrimination of his physician. A contrary practice will but subject him to much and severe uneasiness and distress.

*Utility of Cathartics in Inflammatory Diseases.*—The great utility of Cathartics is not only exhibited in removing offensive matters from the bowels, in depleting the chylopoietic viscera, and exciting a new and more healthy action,—but by the irritation they excite upon the serous vessels, and the mucous follicles, a copious secretion takes place from the extensive surface of the Alimentary Canal, and they become important remedies, as evacuants to the system generally. Hence their great importance, in the treatment of Inflammatory diseases, and in the diversity of cases in which arterial excitement is to be moderated or reduced.\*

In the affections of the *Lungs*, as Pleurisy, and Peripneumony, the employment of Cathartics has been condemned by some practitioners, apparently upon theoretical grounds—yet it will be found that free evacuations from the bowels, conduce, like blood-letting, to diminish the general and local inflammatory action, and by a revulsive operation to determine from these organs.

In inflammation of the Peritoncum and Intestines.

The first object in these cases is to overcome the constipation with which such Inflammatory diseases is commonly so frequently

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\* The Intestinal surface consists of about 1400 square inches, from the whole of which secretion and exhalation are going on, it is obvious that Purgings offers a very powerful means of diminishing the quantity of fluids in the body.—*Percival's Elements*.

attended. This object is accomplished by all the means resorted to, to reduce inflammation—as *venæ sect*, leeches, fomentations, evacuants by the bowels. The last by exciting secretions from the whole surface of the Intestinal Canal, are not the least important. We know that secretion is an ending of inflammation, and is frequently the spontaneous mode of relief to the vessels of an inflamed part. The secretions excited by Cathartics are very considerable, furnished as they are from so many sources. If care therefore is observed in their administration, that is to say, if the stimulus of the article is adapted to the excitability of the part, very beneficial effects will follow. From inattention to this circumstance, the use of Cathartics has been objected to in Enteritis, on the ground that they act as stimulants, and that stimuli applied to its seat must increase inflammation. The conclusion against Cathartics on this ground, is not legitimately inferred—for though their operation is stimulating, yet as they restore secretion, which is almost always diminished in inflammation, they are when employed at a proper period, and of a proper quality, agents to which we should have recourse, in order, as it were, to effect resolution.

The constipation of Intestinal Inflammation is generally attended with vomiting, and almost every thing is rejected which is taken into the Stomach. It is common therefore to regard Cathartics as almost useless, to attempt the reduction of inflammation by bleedings, and afterwards to give Cathartics. This is practice that cannot be relied upon altogether—for though it is proper to bleed, and often freely, and use revulsives, yet we ought not to be satisfied until the bowels have been evacuated. It is true some perseverance is required, the medicine being often rejected as soon as taken, yet it is right still to persist, for although much will be thrown up, some will be retained. The quantity retained accumulates in proportion as it is repeated, and at last, with the aid of enemata, stools are produced, at first small in quantity, but afterwards more copious. With the accomplishment of this object the vomiting ceases, the tension of the abdomen is relieved, and the soreness diminished. This effect gained, it is seldom necessary to resort to bleeding afterwards—the bowels, under the continued use of mild Cathartics, recover their disposition to healthy action.

Although the constipation attendant on Intestinal inflammation is in general overcome by the above means, there are cases in which they have failed; and the disease has in such appeared rapidly approaching a fatal issue. Under these circumstances Calomel becomes a very important remedy, given in doses of 10 grains every 4 or 6 hours, to the extent of producing salivation, and as soon as this has taken place, copious stools have quickly



followed, and a favorable convalescence has afterwards been maintained by Cathartics of a mild character.—*Pring's Pathology*.

Of the utility of this class of medicines in Dysentery, you must have had opportunities of witnessing. There are few diseases less indebted to the natural efforts of the constitution for a cure, and in which the beneficial operations of this class of medicines are more conspicuous. The disease often has its origin in the irritating and vitiated nature of the contents of the bowels, and the first step is to remove these, by the employment of such purgatives as produce a full and speedy operation. As the secretions which are poured into them are perhaps in all cases in a vitiated state, purgatives must occasionally be employed throughout the whole disease. In resorting to this class of medicines, it is proper that the inflammatory condition of the mucous membrane lining the passages, be as little affected by the irritation of the process as possible. The irritation is sometimes so considerable that the patient conceives that his bowels are already too much griped and purged, and it might be supposed that any addition from a purgative substance would be hurtful. This reasoning is not correct, for by experience we are made acquainted, that by these means we remove a much greater irritation, the hardened excrements, and the morbid secretions, which actually cause and keep up the disease.

In Diarrhœas, Cathartics are also highly useful. This disease is frequently brought on by crude and undigested matter passing into the intestines, which by stimulating the excretions and the surface as they pass along, create a copious secretion of the fluids, by which the constitution endeavors to rid itself of the irritation. Or it may be produced by the morbid and acrid discharges of the liver and pancreas, and the multiplied combinations of chemical action, which are formed, when the digestive functions are not in a healthy state. Cathartics become useful in removing the crudities which exist in the bowels, and the utility of the practice is confirmed by general experience.

In Colic, a disease arising from such a variety of causes, it is not to be supposed, that a single agent will be sufficient to contend against it. I have known it speedily removed by the use of an Emetic, and at other times the irritability of the Stomach has been such, that the mildest Cathartic could not be retained. This symptom must first be relieved, and for this purpose, V. S. the warm bath, opiates, administered internally, and by enemata, must be resorted to. As soon as Cathartics can be administered, they should be employed to such an extent as to produce free evacuations from the bowels, and it is only with the accomplishment of this object, that permanent relief will be afforded. The best combination in these cases is Calomel and Opium, given

in large doses, and followed up as soon as practicable with the liberal use of Castor Oil.

There are various other cases of Intestinal derangement in which the good effects of this class of medicines is exhibited, but I shall defer their consideration until speaking of the particular articles best adapted to them.

Not only is this class of medicines of importance in the affections of the Alimentary Canal, but in those of the Chylopoietic viscera generally. Their use affords us the means of depleting from these organs, and by a continuance of the Cathartic according to circumstances, we are able first to alter, and then subdue the derangements which exist. The cases to which I allude are those numerous examples of deranged secretions, hepatic and intestinal, which though not reducible to classes and species, are frequently seen in practice. They are exhibited in the discharges of the patient, in a furred tongue, impaired appetite, feverishness, irritability of temper, and deranged sensations generally. In these cases, Cathartics are not to be used with the freedom which more acute cases require,—they are not to be employed for their evacuant, but their alterative action, and by pursuing this course with steadiness, for weeks, and even months, the happiest effects I have known to follow. It is in cases of this nature that the Blue Pill exhibits a very salutary operation. By its use, the action of the bowels has been kept up for weeks, and though there was commonly two or three evacuations daily, yet the patient without being debilitated, has been gradually relieved of the symptoms I have enumerated, and at the expiration of this period improved in health and appearance. It is probably from a similar action being kept up upon the bowels, that the mineral springs containing active purging ingredients as the Saratoga waters, afford such relief to patients laboring under visceral affections, and this independent of the benefits which are attributable in all invalids to change of air, of scene, of diet, and the gaieties which these situations furnish.

Cathartics in these cases excite an action which is different from the existing one, and to this circumstance we are to attribute many of their curative effects. They induce a new action in the secreting vessels, which though it does not destroy, yet it greatly weakens the existing disease, and they may properly be considered alteratives.

Thus Rhubarb operates in curing Diarrhœa, and thus Cathartics operate generally in the affections I am considering.

In diseases of the Cerebral system, Cathartics are of the greatest service. Their good effects in these cases depend upon their operating in three several ways.

1. Evacuating the blood-vessels.
2. Exciting irritation in parts distant from the affected.
3. Inducing a new action.

In Mania this class of remedies has been applied. The accession of this disease is often attended with symptoms strongly indicative of a deranged state of the chylopoietic viscera. The suffused complexion, the fetid breath point out the disordered state of the Stomach and bowels—the tongue is tremulous, and covered with a white slime, the appetite is impaired or depraved—the bowels are constipated, and sometimes in an extraordinary degree;—but nothing is more remarkable than the fœtor which taints the atmosphere of the patient. It is most offensive when the alvine constipation has been of longest duration. If the abdomen of a patient labouring under an acute paroxysm be examined, it will commonly be found tumid, especially in the region of the epigastrium. But whether this disease has its origin in gastric or cerebral derangements primarily, the treatment is equally obvious. The brain is highly excited, and the following symptoms point out the great determination which takes place to this organ. Inflammatory affections of the eye and other parts of the body, are known to subside upon the approach of this disease, and the pulse in highly excited cases, is frequent and small. The vivacity and strength of the patients perceptions, the increased energy of the imagination, his restlessness, his loquacity, all denote the brain to be in a highly perturbed state, and the action of its vessels greatly increased. The great insensibility to impressions, and to the action of medicines, prove how much the equilibrium of the sensations is disturbed, and their concentration in the cerebrum. In whatever light, therefore, the origin of these diseases is considered, the great utility of this class of medicines is equally conspicuous. If from a deranged state of the Intestinal Canal, their great efficacy cannot be questioned,—if from excitement of the vascular system of the brain primarily, Cathartics by their depleting and revulsive action, tend greatly to lessen and divert its effects. From the insensibility of the system to impressions, and the torpidity of the Stomach and bowels, the means we employ should be of a very active nature, and accordingly drastic purgatives are required. To show the influence of Cathartics upon the brain, no diseases so frequently alternate as Mania and bowel complaints.

In Epilepsy, Cathartics have been employed with great success. This disease is connected with great mobility of the system—very often with irritation in the intestines. Thus it is produced by worms, by the sordes in dysentery, by poisons, by repelled eruptions, and very often by constipation of the bowels. The treatment, when connected with any of these causes, is not only to evacuate the bowels, but to continue the Cathartics from day to day,



unless imperiously forbid by circumstances. By this practice more cures have been effected than by any other, and I believe that in conjunction with other means, as attention to the state of plethora in the vessels, with a regular system of dieting, many cases may be effectually cured.

In the treatment of Apoplexy, these agents are equally conspicuous. Employed before the accession of the disease, they are capable of preventing this distressing complaint, and they are suitable when it exists. This disease exhibits itself generally in an undue distension of the vessels of the head, and its proximate effect would seem to consist in compression of the brain, produced either by the distended blood vessels or an extravasation of blood. If effusion has not taken place, Cathartics are useful with other means, as general and local bleeding, with irritating applications to the extremities, to lessen this determination to the head, to dissipate this disordered state and to re-establish its freedom of action. The purging, to be effectual, must be copious, and produced by the most active medicines. Even when there is effusion upon the brain, producing the symptoms of compression, the action of purgatives upon the surface of the Intestinal Canal, is always advantageous: but their power to contend against this state of the brain is unfortunately very limited. The consequences of Apoplexy are very various, and purgatives are frequently required to contend with them. With these remedies we remove the obstinate constipation which torments the sick and which announces a diminution of the nervous influence upon the intestinal structure. The Canal is in a state of torpor in these cases, and it becomes necessary to make a strong impression upon it, to excite its action. It is necessary to employ active Cathartics, and the doses must be increased to obtain alvine evacuations in a sufficient degree.

In Paralysis, as induced by the same causes as Apoplexy, the same remedies are equally beneficial. Active articles are effectual here, and as auxiliary, nothing is better than blisters or issues. To be effectual they must be applied to the back of the neck, the back of the ears, or what is preferable, the crown of the head.

In Hydrocephalus Internus, purgative medicines have been highly commended. Of late years this disease has been referred to the disordered condition of the alimentary canal, and the vitiated condition of its contents. In post mortem examinations of hydrocephalic patients, there has been found in the liver the remains of great inflammatory action, and also proofs that undue irritation had existed in the alimentary canal. Mr. Abernethy declares, that in similar examinations of cases that had died with unequivocal symptoms of hydrocephalus, he found the brain perfectly healthy, the only diseased appearance being in the bowels. Other proofs might be adduced, but I shall content myself with remarking, that

whatever be the pathological views entertained, purgative medicines are among the most important of our remedial resources. They remove the remote cause of disease, and determine the flow of blood from the brain. They may from all that has been said of their application to disease, be considered as exercising a more powerful effect in lessening the action of the vessels of the head, than any other internal remedies we can employ.

I shall speak of the utility of Cathartics in Dropsies, with a view of bringing before you, the action of these medicines upon a system of vessels, to which allusion has not been made; these are the absorbents. The action of Cathartics in promoting that of the absorbents, depends upon the copious secretions which take place from the surface of the intestines, occasioning a deficiency of serous fluids in the blood-vessels, and the consequent effort in the powers of the system to restore the deficiency which has taken place. But it is not only by this process that the fluids are evacuated—the action of these medicines is extended to every part of the body, they increase the energy of the absorbents, and they augment in this manner the discharge of urine. The practice of using Cathartics in Dropsies, has been of very ancient date, and it probably may have been suggested by the occasional natural cure of Dropsy by a spontaneous diarrhœa. Hippocrates, in several parts of his writings, notices the salutary effects of such a diarrhœa in the beginning of Dropsy. However the practice originated, there are certainly no means in our power of procuring a copious evacuation of serous fluids more effectually, than by the operation of purgative medicines, and none, perhaps, more successfully employed in the cure of Dropsy. The relief is generally in proportion to the quantity of fluids discharged, whence it is the custom to employ purgatives of the more active or drastic kind. The employment of them should be regulated, however, with some caution and discrimination. Where the constitution is obviously much broken by age, long continued disease, or intemperance, all violent operations and copious discharges will be detrimental; they will tend but further to weaken the body, and to render it less able to support the ravages of a severe disorder. When the age, habit, strength and other circumstances of the patient admit of their use, they may be very beneficially resorted to. The form of Dropsy to which they are most successfully adapted is ascites. The watery fluids discharged by purging in this state, are evacuated from branches of the same arteries which pour out water into the abdomen, and the stimulus of the purgative is most directly communicated to the absorbents of the abdominal surfaces. There are cases of Dropsy attended with so much organic disease that purging alone cannot relieve them. The use of mercury is very beneficial in these cases.

I might thus continue to enumerate various other diseases in which Cathartics are indicated or afford relief—but the description would only cease with the detail of the diseases incidental to the human body, for there are few or none, in which beneficial effects do not follow their use. Having, however, pointed out the nature of their operation, with their positive and relative effects, and their application in the diseases of most common occurrence, I proceed to the consideration of the individual Cathartics.

#### PARTICULAR CATHARTICS.

In treating of this division, I shall pursue the same order as in the consideration of Emetics, arranging the articles of the class into Vegetable and Mineral Cathartics.

*Family Euphorbiaceæ.*—Of the vegetable, the first that I shall treat of, is the Oleum Ricini or Castor Oil. This is the product of a plant the Ricinus Communis or Palma Christi, a native of both Indies. It grows very well in most parts of the United States. The seeds are the part which furnish the oil, and in consequence of their being variegated with dark and light stripes, like the Ricinus or Tick, the plant has been called by the same name.

#### DESCRIPTION OF THE PLANT

Stem round, thick, purplish red color, and rises to the height of 6 or 8 feet.

Leaves large, and divided into 6 or 7 lobes.

Flowers in spikes, male and female flowers separate—the males form the lower part of the spike, the female the upper.

Stamens numerous, styles three, capsules three celled, seed solitary.

*Preparation of the Oil.*—It is obtained from the seeds by expression and decoction. That procured by the former of these modes without heat, and denominated in the shops “cold drawn oil,” is the best. It is limpid and destitute of smell and colour. The oil obtained by decoction is not so pure, it is more nauseous, dark coloured, sooner becomes rancid, and is more active in its operation.

It is prepared by decoction in the following manner. The seeds are bruised in a mill or mortar, thrown into a large kettle or boiler of water, and the whole is then boiled until the oil is separated, and floats upon the surface—an attendant skims it off as fast as it separates, and from time to time deposits it in a suitable vessel until all the oil is collected from the seeds. This is the red or Jamaica oil, and from its containing a portion of the oil of the shell, is more active than that obtained by expression. It should be observed, that in the shell surrounding the pulp, there exists an oily substance, extremely acrimonious, and which acts as an irritating Emetic and Cathartic.



The process may be improved by separating the husk from the pulp and boiling as above. The oil thus obtained would be of a lighter colour and less acrimonious.

By expression—When this process is to be employed, the seeds are spread out upon platforms, or in an airy building, and the surfaces exposed to the atmosphere frequently changed. As the husk dries it becomes very brittle, and when perfectly dry, splits, and leaves the pulp. When all the husk, by this means, has been separated, the seeds are collected into heaps, and when they are to be expressed, are first heated in an oven constructed as a baker's, carried to 110° of Fahrenheit. When sufficiently heated, they are taken out and removed to a mill press, for the expression of the oil. The press is constructed like a cotton press, with a screw passing through a beam, turned by animal power, and the end adapted to a plug, which is accurately fitted to a cast iron cylinder. As the seeds are compressed the oil escapes through small openings at the bottom of the cylinder, and is conveyed off by a tube or pipe leading to a proper vessel.

In this state it is impure and contains much amylaceous matter. It is separated by several means—by rest, the facula or fairnaceous matter will subside to the bottom of the vessel, and the fluid above become clear,

Or the surface of the oil may be spread over with chalk, sulphuric acid sprinkled upon it, and as it subsides, it carries the impurities in the oil along with it to the bottom. The cake which remains after the separation of the oil, may be boiled, and from it a portion of inferior oil can be obtained.

An acre yields 6 bushels of seed.

From a bushel of seed, a gallon and a half of good oil can be obtained, and a half a gallon of inferior oil.

I have observed that the seeds must be separated from the husk which invests them, as it possesses a great deal of acrimony, and acts as an Emetic, and irritating Cathartic. Its effects in this way have been noticed by most writers on the *Materia Medica*.

Medical uses.—Castor Oil is one of the mildest and most extensively employed articles in the *Materia Medica*. It is so innocent in its operation, and at the same time so salutary, that it is administered without hesitation in the commencement of sickness, and is one of the substances most commonly resorted to before professional aid is required. It does not stimulate the bowels to any great degree, nor occasion griping, but operates gently, and where the system is but slightly disordered, it commonly is most sufficient to re-establish a healthy action. In the diseases of children it is particularly valuable, and to their cases the strength of its impression is peculiarly well adapted. There are few articles, which for common purposes could supply its place, and fewer still

which in the hands of the common people, who interfere so largely in the diseases of this interesting portion of the species, can so safely be trusted.

It is not however to their cases that its use is limited, but in many of the intestinal affections of adults, it exhibits no less valuable and agreeable effects. As it does not stimulate the bowels very greatly, or gripe, it is admirably calculated to keep them open in sedentary and costive habits. To these cases it is well adapted, as the resinous Cathartics increase costiveness, and lose their effects by habit—whereas it is observed of Castor Oil, that if it be frequently repeated, the dose of it may be gradually more and more diminished, and it always leaves the bowels in a loose state—having, in this respect, a great advantage over salts.

It is particularly suited to cases in which more irritating purgatives would prove hurtful, as in nephritic and calculous affections, after injuries and surgical operations, in which the abdominal viscera are concerned.

In the various grades of colic, its use is too well known to need particular attention—but we cannot trust to it when large evacuations are required, for it will insinuate itself through the intestines, bring with it only their more fluid contents, and leaving the indurated feces. When used in such cases it should be several hours after the exhibition of a dose of Calomel and Jalap. Thus exhibited, it promotes purging, and mitigates the harshness of the drastic medicines.

Castor oil is much used in the early stages of Dysentery. In these cases it lessens the griping and general distress, diminishes the tenesmus, and the frequent desire to evacuate the intestinal canal. I have commonly found that more benefit was derived from more active Cathartics, as Calomel and Rhubarb or Jalap. I have never observed that the action of these articles increased the irritation of the bowels, but on the contrary, by expelling the morbid contents, which milder medicines could not effect, the greatest benefit has been derived.

Castor oil is the basis of a formula called the Oleaginous mixture which is much employed in the diseases of the bowels. It is prepared as follows—

R. Castor Oil, ℥ii.

White Sugar, ℥iii.

Mucilage Gum Arabic, ℥i. to be well rubbed together, add slowly Water ℥v.

Laudanum, ʒss. to ʒi. Dose, ʒss. to ʒi. pro re nata, until relief is obtained.

In place of Gum Arabic the yolk of an egg, or a thick emulsion of Almonds, or honey may be employed to promote a union between the oil and water. Thus prepared the taste of oil is disguised, and we have formed a very useful mixture.

Besides these diseases, Castor oil is much used in hæmorrhoids, hæmorrhages, calculus, and in the diseases of parturient women.

Modes of Exhibition.—This oil, though so valuable in many diseases, and capable of fulfilling so many indications, yet is often rejected, from the prejudices which exist against it, proceeding from its nauseousness, and the difficulty of swallowing it.—It may be given floating upon peppermint water, or some other vehicle—it is sometimes given in coffee, or mutton broth, in tepid milk, in lemonade, or in any aromatic water, in the Comp. Tinct. of Senna. This last answers very well, as when blended with the oil by agitation, it conceals its qualities and increases its operation.

The dose is an ounce for an adult, and for the youngest child, under ordinary circumstances, a tea-spoonful. In urgent cases it may be increased to a great extent.

Adulterations.—This oil is frequently adulterated with Olive or Poppy oil. There is a peculiarity about Castor oil, (says Mr. Mr. Brande) which will serve to distinguish it from any other fixed oil, viz: its great solubility in rectified spirit—for instance,  $\frac{z}{iv}$ . of alcohol, will mix uniformly with any proportion of Castor oil, whereas it will not dissolve more than  $\frac{z}{i}$ . of Linseed oil. This then will serve to detect the adulteration.

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*Family Euphorbiaceæ.—Croton Tiglium.*—The next article to be considered is Croton Oil, obtained from the seeds of the Croton Tiglium. This medicine which has lately been introduced as new, is an article the medicinal properties of which were long known. It will, in this instance, be observed that most of our new discoveries will turn out to be nothing more than the revival of ancient practice. So late as the year 1749 the plant was described in a work written by Jacob Robart, and entitled, a history of the plants of the University of Oxford, and his account is said to have been very accurate. It was afterwards described by several other distinguished persons, as Linnæus, Bergius, and others, and the medicinal qualities of the plant fully explained. As it has lately been revived and introduced into practice, a short account of its history will be proper in this place.

The Croton Tiglium, (English term purging Croton.) is a native of the Island of Ceylon, but it has been found in Malabar, China, and the Molucca Islands. It is a small tree, seldom exceeding the height of ten feet, and is covered with a small bark of greyish colour. The seeds of this plant, or the expressed oil of them, when taken internally, act as a very powerful hydragogue cathartic, and hypercatharsis is frequently produced. Given in the dose of a drop of the oil, or a single seed, it purges very actively, and in particular cases with such energy, as not always to be safe.



It is said, that the natives of Ceylon, particularly the poorer classes, generally take one of the seeds for a dose. The effects of one of the seeds when chewed and swallowed, are thus described by Dr. Bigelow, in a note in his Sequel. It produces no immediate unpleasant taste, but when swallowed a sensation of heat came on in the fauces and throat—this feeling extended to the stomach and bowels, and in less than half an hour, a violent cathartic operation commenced which was repeated more than twenty times in three hours. When the oil is applied externally, it generally produces a great degree of local inflammation, which does not subside for many hours and sometimes days. The violent action which the oil produces, may be diminished by conjoining with it an aromatic, particularly any of the aromatic oils. Another mode of lessening the action of the oil is by roasting or baking the seeds previous to obtaining the oil from them.\*

Croton oil is recommended in cases when a very active Cathartic is required, as in obstinate Constipation, when there are no inflammatory symptoms to contra-indicate its use. I have no doubt that the oil may be used with advantage, if administered with caution.

In Maniacal cases, its use has been attended with success, and from its irritating action upon the stomach and bowels is doubtless well adapted to them.

By the natives of India it is used as a drastic cathartic in Dropsy, and it is even said to be effectual in expelling the Tape worm. In this latter disease, judging from the nature of the article, and its effects, I should be anxious to give it a trial. When the tape worm has been expelled, it is by the drastic irritating quality of some article like the present.

The Croton may be given in substance, in the expressed oil, and in tincture. In substance it is most violent, and therefore is seldom used.

The oil may be given in the dose of a drop, which in particular cases, and under certain circumstances, may be augmented to two.

The following formula is a good mode of exhibiting it.

R. Oil of Croton, 1 drop.

Oil of Caraway, 1 drop.

Confection of Roses, grains iv. To be mixed and formed into a pill.

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\* Mr. Pope recommends a new method of preparing the Croton Teglium, by which its efficacy as a Cathartic is unimpaired, while its acrid and irritating qualities are obviated. These qualities exist in the husk or shell and the eye of the seed, the medulla being free from them. This is the part used by the natives of India as an ordinary purgative. The oil prepared from this part of the seed, may be given in a substance, in pills or tincture, without any unpleasant effects.

The Tincture is made in the following manner.

R. Croton seeds, bruised ℥ii.

Alcohol,  $\frac{1}{2}$  pint.

Triturate the seeds thoroughly with a small part of the alcohol, then add the rest—digest for 10 days, and filter the mixture. The dose is ℥i.

Adulterations.—The Oil of Croton, from its high price, is frequently adulterated with Olive or Castor Oil.

*External application of Croton Oil.*—This oil has been applied externally as the Tartar Emetic. It produces an eruption much more speedily, one which is not attended with such suffering to the patient, and one which is very effectual. The eruption produced by the oil bears a considerable resemblance to chicken pox, that of Tartar Emetic to small pox.

Ten drops of oil are rubbed over the part steadily, and by two rubbings an eruption will be obtained, sometimes three or four are required. The appearance is that of a rash, with extended inflammation, uniform redness, and in the midst of this, there are many little vesicles about the size of a pin's head. Two or three may run together and be confluent, and then they will be large. They do not contain clear, but puriform fluid, so that they are sometimes between vesicles and pustules.

Thus employed it has been useful in Rheumatism, when other means had been unavailing.

In affections of the heart, it has also been employed by rubbing the skin in the neighborhood of the part affected. Dr. Short, a surgeon practising in the East Indies, has employed it in this manner, and with advantage.

It may be a useful article to restore repelled eruptions, scarlatina, measles, &c. Its external application has been known to produce purging though I believe very rarely.

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*Family Euphorbiaceæ.*—*Euphorbia Lathyris*, or *Caper Tree*.—It is commonly found in Europe, on the borders of roads and cultivated places.

From the seeds of this plant, there is obtained by pressure, an oil which in common language, is called oil of Spurge. It much resembles the Oleum Ricini, has the same colour, is a little less dense, has no odour and no bad taste. Its action upon the system is purgative, and its effects are sure and very prompt. It is said to be the most quick and safe of the newly discovered purgatives. It does not produce vomiting, nor colic, nor tenesmus, and it may be administered in cases where there is intestinal irritation.

It has been employed in Fevers, in Dysenteries, in anasarca when following Intermittent Fever, and in all cases where it is wished to purge lightly and with a small dose of medicine.

The dose varies with the age. That for children 2 or 3 years old, is three drops—for adults, four to eight drops. It may be united with the paste of Chocolate, or syrup, or in a wine-glass of sweetened water.

I have employed this article in costiveness, as an evacuant medicine, in two cases. In both instances three drops were given every two hours until 18 drops were taken in one instance, and 30 in another, with such little effect that it was discontinued. No unpleasant effects were produced from it, and the taste was not disagreeable.

It is spoken of in terms of considerable commendation in Magendie's Formulary, and it is possible that what was employed may not have been of a good quality. You may be more successful in your trials.

This oil may hold an intermediate station between Castor oil and the oil of Croton.

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*Family Jasmineæ.\*—Olea Europæa—Olive Tree.*—This tree grows to the height of 30 feet.

Leaves firm, narrow, lance shaped, standing in pairs.

The flowers are small, white, numerous, found in clusters near the footstalks of the leaves, flowering from June until August.

With the fruit, all are acquainted, which when preserved adds much to the pleasures of the table.

Olive Oil is the product of the Olive tree, a native of the south of Europe, and the north of Africa. It is cultivated in France, Spain, and Italy for the sake of the fruit and the oil expressed from it. The oil is obtained from the fruit by bruising, and pressure so regulated, as not to break the kernels of the Olive.

It is employed in disease externally and internally. As an external application it has long been the custom in Italy to anoint the body with it in Fevers, and the practice is strenuously recommended by the physicians of that country. The effect of it when applied to the surface, has been, a speedy reduction of the force and frequency of the pulse. From such experiments made by a graduate of Philadelphia, it appears that its application at four different periods during the space of 6 hours, reduced the pulse from 72 to 52 strokes in a minute. The experiment being repeated several times produced the same results. Upon this principle can we not account for the practice of anointing the body with oil, so common with the inhabitants of hot countries. It is used in this manner by the people of Africa, and some parts of Asia—it is also a custom among the inhabitants of the Islands of the Pacific Ocean. But its use in fevers is not confined to

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\* From *Jasminum*, one of the genera comprehended under it. This order is remarkable for the fragrance and elegance of its flowers.



Italy. We are told that it is employed at Grand Cairo and Smyrna in the plague. Of its utility in fevers of great morbid excitement, there can be no doubt, from the sedative influence exhibited in the experiment above related, and as the remedy is innocent, and the prospect of service from it favorable, a few trials of it should not be neglected.

It has been employed externally in other diseases, particularly in Dropsy, and the success of the application in a number of cases, has been related by Dr. Oliver, in the 49th volume of the Philosophical Transactions. Friction was in every instance joined with it, and it is difficult to say, from the known efficacy of friction in Dropsy, how much is justly to be ascribed to the oil itself. Since, however, from a more just pathology of this disease, Dropsy has been considered not only a consequence of fever, but a febrile affection itself, may not the oil from its sedative effects upon the sanguiferous system, equalize the excitability, and restore the lymphatics their natural proportion. In every instance in which it was used, the quantity of urine was increased.

Olive Oil united with lime water, in equal proportions, forms an excellent application to burns, being extremely soothing and pleasant; and it enters largely into the composition of various cerates for wounds. It is also applied to parts inflamed from the bites of venomous insects.

Taken internally it is a mild and pretty certain laxative, having all the properties of the former article without being so offensive. It may be used in all the diseases in which Castor oil has been employed, and it is said to be decidedly preferable in cases of colic in children, and when poisons have been taken. It may be given in large doses, to children, a table-spoonful every hour, and in cases of poisoning to any extent. In obstinate constipation it has succeeded, after very drastic purgatives had been employed without success, and is therefore deserving of a trial before recourse is had to severer measures. Several cases are recorded of the utility of this article in obstinate constipation, and in particular after very severe remedies had been tried without effect. One reason of its efficacy is, that relying upon its mildness very large quantities are administered, and in this manner insinuating itself into the bowels, it gradually softens down the indurated feces, allays irritation, and by its stimulus being adapted to the excitability of the surface of the canal, may allow the feces to pass onwards, when more stimulating articles would excite contraction, and thus restrain them. For these reasons it should always be employed before resorting to the Tobacco enema.

Olive Oil has been recommended when the mineral poisons have been taken, but I believe it possesses no peculiar advantage, and that our hopes of correcting their operation must depend upon Chemical resources.

*Family Jasmineæ—Fraxinus Ornus, or Flowering Ash.*—Manna is the product of the *Fraxinus Ornus*, a tree greatly resembling our common Ash. It is a native of the southern parts of Europe, particularly of Sicily and Calabria. In Sicily this species of *Fraxinus* is cultivated for the purpose of procuring the manna, and after acquiring a certain age, it yields a sweetish juice in considerable quantity, which concretes upon exposure to the air. The Ash is not the only tree which yields a fluid of this nature. Many others may be enumerated, as the Maple of our country, and in others, the Larch, the Walnut, &c. In all it may be considered as a part of the Sugar so universally present in vegetables, and which exudes upon the surface of a number of them. Although the *Fraxinus* yields this juice spontaneously, to which the name of Manna is given, yet incisions are made into the bark, in order to obtain it in a more considerable quantity. When these incisions are made, a whitish juice begins to flow, which gradually hardens on the bark, and in the course of eight days, acquires the consistence and appearance in which Manna is imported into this country. The different qualities of Manna, depend upon the different impurities which become mixed with the juice, and the circumstances under which it is obtained from the tree. That which exudes slowly is always more dry, transparent, and pure, and consequently more esteemed. In its chemical composition it consists of sugar, mucilage and extractive matter, to which its taste and other peculiar properties are owing.

Manna, is well known as a gentle purgative, so mild in its operation that it may be given with safety under any circumstances. It is however, in some constitutions apt to produce troublesome flatulence, heart-burn, &c., on which account it is seldom used alone, but rendered more active by combination with some other cathartic of a more powerful nature, as senna, or salts, or both—Vide Formula, Article Senna. Thus employed, its activity is increased, and at the same time it acts as a corrective, and lessens the irritating operation of other cathartics. It is therefore much employed for children combined with magnesia, rhubarb, salts, or jalap. It is however a medicine less prescribed by physicians than formerly, though much in vogue with nurses.

Dose, ʒi. to ʒii.

When given to children alone, I direct as much as they will eat, which is usually about ʒss.

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*Family Leguminosæ.\*—Cassia Senna.*—The genus *Cassia* contains many species. They have been distinguished by modern botanists into *Cassia Anctifolia*—*C. Obovata*—*C. Lanceolata*.

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\* From *Legumen*, a pod.

The first is the best. Senna is a native of Egypt, it also grows in some parts of Arabia, particularly about Mocha—but as Alexandria has ever been the great mart from which it has been imported into Europe, it has long been distinguished by the name of Alexandria Senna.

The leaves are of an oblong figure, pointed at the ends, about a quarter of an inch broad, and not a full inch in length, of a lively yellowish green colour, a faint, not very disagreeable smell, and a sub-acrid, bitterish, nauseous taste.

The Senna Italica or blunt leaved Senna, is a variety of the Alexandrian species, which by its cultivation in the South of Europe, has been found to assume this change. It is less purgative than the pointed leaved Senna, and is therefore given in larger doses.

Senna which is in common use as a purgative, was first known to the Arabian Physicians, and the first of the Greeks by whom it is noticed, is Actuarius, who does not mention the leaves, but the pods. Mesue likewise gives a preference to the pods, as being a more efficacious cathartic—but the fact is the contrary, for it purges less powerfully than the leaves, though it has the advantage of seldom griping the bowels, and of being without the nauseous bitterness which the leaves possess.

The French Chemists in analysing this article have separated several principles as follows—

Cathartine.

Fixed Oil.

Volatile oil.

Albumen.

Yellow colouring matter.

Malate of Lime,

Acetate of Potash.

The principal of these substances is Cathartine, an uncrystallized substance which is said to purge in very small doses.

It is of a yellow colour, of a peculiar odour, a taste bitter, and nauseous, soluble in water, ether and alcohol.

Medical properties.—Senna is deservedly held in estimation as an active and sure cathartic. It is seldom given alone, or in substance, but combined with other cathartics, either to increase their activity or to lessen the irritating operation of its own action. The testimony in its favor is considerable. Dr. Fordyce in speaking of it says, that so far as he could judge from experience it is the most certain stimulus to the bowels in producing purging, of any substance which he has ever tried. Dr. Cullen who was much opposed to it, admits that it is a very certain purgative, operating moderately and seldom to excess. The principal objection that is made, is its tendency to produce griping. I do not think



that it exists in a greater degree in Senna, than in the other resinous purgatives, nor is it more difficult to obviate. Senna, though objected to by a great many physicians, I have uniformly found an active article, and by no means harsh or severe in its operation upon the bowels. I never employ it alone, because its active principle resides in a bitter extract, which is not very soluble. It is however sufficiently so, when united with any saline substance, to prevent any griping operation which would otherwise take place, and its activity is much increased. The manner of employing it is the following—

To an infusion of Senna prepared by pouring a pint of warm water upon  $\mathfrak{zss}$ . of the leaves, I direct  $\mathfrak{zj}$ . or more of salts to be added, with  $\mathfrak{zss}$ . of Manna.

The dose is a small tea-cupful every hour or two until it operates. Thus prepared it is an active and certain Cathartic, having succeeded with it, after Calomel, and Jalap, and other active articles had failed. It is not very nauseous—in general it agrees well with the stomach. In preparing the infusion of Senna it should not be allowed to boil, as the active matter is of a volatile nature, and it would be dissipated by the heat. The infusion will also spoil in 48 hours in warm weather, and by being exposed to the air, the oxygen combines with extractive matter forms a yellowish precipitate, which gripes violently, but does not purge. On which account, the infusion when prepared, should be kept in covered vessels.

There are no particular forms of disease to which Senna is adapted. It is resorted to, prepared in the manner I have mentioned, in removing costiveness, in cleansing the primæ viæ, and relieving thereby many of the constitutional derangements dependent upon these causes. In the advanced stages of disease it is also employed in small quantities, where we wish an alvine discharge without purging.

For children, an infusion of Senna sweetened with sugar and with the addition of a little milk, given in the form of tea, is readily taken, and operates with much certainty.

There has been a number of officinal preparations of this article, but the forms of giving it which have been mentioned, supercede them all. There is one preparation, the Comp. Tinct. of Senna, which is occasionally useful by being mixed with cathartic mixtures, in adding to their strength. For the preparation of it I refer you to the dispensatories.

The dose is from  $\mathfrak{zij}$ .  $\mathfrak{zss}$ . in any appropriate vehicle.

This is the preparation with which I advised the Castor Oil to be taken, and while it is palatable, the strength of the mixture is increased.

There is yet another mode of using this article:—in the form of Enema. An infusion of the leaves is prepared stronger than when intended for its internal administration. In the quantity of a pint it is a very excellent and active article; if necessary a little salts or oil may be added.

Adulterations.—With the leaves of the Cassia Senna there is often mixed those of various other plants. For example

*Coriaria Myrtifolia.*

*Ilex Aquifolium.*

*Buxus Sempervirens.*

The adulteration takes place in the following manner. The leaves of Senna are collected twice a year, in March and September. The branches with the leaves are dried in the sun, and when fully dried, the leaves are stripped from the stems, and these last thrown away. They are collected by the poorer classes, coarsely pounded, and mixed with the leaves of other plants, and sent to Europe by the way of Alexandria.

The seeds obtained from pods, often mixed with the oriental Senna, would, if planted, afford a very good substitute for the imported article.

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There exists in this country a species of Senna, nearly allied to the foreign in all its properties, viz:—

*Family Leguminosæ—Cassia Marylandica.*—Description of the plant.

Stems growing to the height of 5 or 6 feet, round.

Petioles compressed, bearing 8 or 10 leaflets.

Flowers growing in axillary racemes.

Petals five, bright yellow.

Stamens ten.

Fruit, a long pod.

It differs but little in appearance from the Senna of the shops, and from repeated trials of it, by practitioners in the country, it is found to be safe and certain. It is said by some to be more apt to gripe than the imported Senna, a quality which may be in a great measure corrected, by infusing with the leaves a small quantity of liquorice root or any aromatic. In using it, the quantity employed is larger than in the preceding instance, about a third more, but the manner of preparing it and the dose are the same.

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*Family Juglandæ—Juglans Cinerea.*—The next of our native Cathartics is the *Juglans Cinerea*, or Butternut, also known by the names of Oilnut and White Walnut. This tree grows in various parts of the union, principally in the Northern and Middle States, also the western part of our State and the western country. It is of considerable utility, not only for the purposes to

which the wood is applied, but from the sap possessing a saccharine quality, and being furnished in considerable abundance. In the 3d volume of the Massachusetts Agricultural Repository is an account of an experiment made on this tree, by Mr. Gray. He states that 4 trees, the trunks of which were only from 8 to 10 feet in diameter, produced in one day, nine quarts of sap, from which was made one and a quarter pounds of sugar.

The inner bark of the tree, especially that obtained from the root, affords one of the most mild and efficacious laxatives we possess. An extract is usually made from the bark which is not only a more convenient, but a more active preparation, and was much used during the revolutionary war, when the more expensive medicines could not be obtained. In the trials that were made of it, it was found to be a valuable medicine—since that time it has fallen into neglect.

From numerous experiments with the article, Dr. Bigelow thinks that it is entitled to the consideration of a useful and innocent laxative. When fresh and properly prepared, it is very certain in its effects, and leaves the bowels in a good state.

In cases of habitual costiveness, it is to be preferred to more stimulating cathartics, and many persons whose state of health has rendered them dependent upon the use of laxative medicines, have given this the preference after a trial of a variety of other medicines.

The dose of the extract is from 10 to 30 grains, it is improved by combination with calomel in a dose of x. grains each. The extract is stronger when prepared from the bark in the month of June.

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*Family Podophyllæ—Podophyllum Peltatum, or May Apple.*—It grows in every part of our country, and has attached to it a variety of names, as May Apple, Mandrake, Ipecacuanha, &c. Different parts of this plant are endued with different properties. The fruit is esculent—the leaves poisonous, and the root cathartic. The root is creeping and jointed, and when dry is brittle, and readily reduced to powder. Its taste is unpleasant, and when chewed for some time becomes intensely bitter.

The stem is about a foot in height, is smooth, round and erect, dividing at top into two round petioles from 3 to 6 inches long—each petiole supports a large peltate palmate leaf, divided into 7 lobes. In the fork of the stem is a solitary flower. The flower is followed by a large ovate yellowish fruit, which is one celled—Class polyandria.



This plant is often confounded with another, the *Passiflora Incarnata*, Class monodelphia, pent.

The root of the *Podophyllum Peltatum* is one of the most efficacious cathartics which has been discovered in this country. It is nearly allied to Jalap, and might very well be substituted for it. In doses of 20 grains it is a safe and active cathartic, and may be used either alone, or in combination with calomel and the Cream of Tartar.

It has been particularly recommended in dropsy, in which disease it is well adapted by the large evacuations it produces, and it has also been employed in cases of Intermittent and Remittent Fevers.

The P. P. is less known to us than it deserves. Dr. Zollickoffer, a physician of Baltimore, who has been in the habit of employing this root for sometime, gives it a preference to Jalap. Twenty grains in the generality of cases, he says, will be sufficient to operate as a cathartic, but the dose may be increased to 30 grains, without its being attended with any drastic effects. It will never be found to give the least uneasiness to the patient, when it is combined with Calomel, in the proportion of 10 grains each. A watery extract may be prepared from the root, the dose of which is from 6 to 10 grains.

I have experimented with this article in a sufficient number of cases to determine upon its efficacy. It appears to act with considerable energy, and to be, as far as I may be allowed to judge, of more decided activity than Jalap—not being more liable than that article to produce griping, pain, or other irritating operation—Being readily obtained, and not liable to adulterations, it may with more certainty be resorted to, and in every respect may with great propriety be substituted for Jalap.

*Family Convolvulaceæ.\*—Convolvulus, or Ipomea Jalapa.*—Jalap is a vigorous plant with a tuberose root, white, fleshy, lactescent, giving origin to a number of shoots, which run to a considerable height.

Leaves alternate, petiolated, subcordiform, acute, entire, or often-times divided into 2, 3 or 5 lobes, glabrous above, and of a violet structure beneath.

The flowers are solitary, axillary, and of a violet colour.

The Jalap root acquires a considerable size, but most commonly they are about the weight of a pound or less. They are found in the shops cut into hemispherical pieces, or round, about the size of two or three inches in diameter.

The plant is a native of South America, and is to be found growing in considerable quantity about the city of Xalappa in

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\* From convolve, to entwine, to wrap round.

Mexico, whence its name is derived. It is also found in Vera Cruz.

The roots of this plant when dried, are of an oval shape, solid, ponderous, blackish on the outside, but grey within, and marked with several veins, by the number of which, and its hardness, heaviness, and dark colour, the goodness of the root may be estimated.

The chemical analysis of Jalap present us with several principles. The most important are—a resinous matter, a gummy extract, a ligneous principle, several salts, &c.

The analysis of 500 grains of Jalap furnishes us with the following principles—Water, 24 grains—Resin, 50 grains—Gummy Extract, 220 grains—Starch, 12 grains—Albumen, 12 grains—Ligneous matter, 145 grains—Phosphate of Lime, 4 grains—Muriate of Pot.  $1\frac{3}{4}$ —Carbonate of Lime, 2 grains, &c.

The purgative property of Jalap appears to reside in the resinous matter which it contains, but it exists in different proportions in different roots. On this account, much irregularity occurs in the operation of this medicine—an ordinary dose frequently exerting a brisk cathartic action, and in another parcel a very feeble effect is produced. The difference in these results is explained upon the variations which often take place in their intimate composition. These are dependent upon the diversity of soils in which the roots are planted, on the state of the plant at the time it is dug up, or on the season of the year. The gummy part bears a considerable proportion to the resinous, but has little or no cathartic power.

Medical uses.—Jalap is unquestionably a very efficacious and safe cathartic, and as such was employed by the Mexicans, previous to the discovery of America. It was not introduced into Europe until about the year 1610. In point of utility, and the purposes to which it is applied, either according to the dose in which it is given, or its combination with other medicines, it bears the same relation to cathartic substances, that the Tart. Antimony does to the rest of the Emetics.

It is not so powerful as some others, but it can be resorted to in a greater variety of cases, and the readiness and facility with which it operates, with the beneficial effects which follow its use, justly entitle it to be considered as a very valuable article.

Jalap, however, is rarely given alone, but is combined with other medicines of the same nature, either with a view to quicken its operation, to obviate its griping quality, or to enlarge the sphere of its activity.

The cathartic, I greatly prefer for ordinary purposes, is a combination of the Sulphate of Potash with Jalap, in the proportion of 10 grains of each, united into a powder, and repeating it every

two hours until it operates. To this may be added any aromatic oil, as cinnamon or aniseed to prevent griping, though this rarely takes place, and any addition of this nature often impairs its activity. Where free catharsis is required, I do not know a better formula. The action of the Jalap is much quickened by the addition of the Salt, and by being carried rapidly through the bowels, but little griping follows.

The doses are usually repeated two or three times before catharsis takes place, and from the free discharges which follow its use, it is well calculated to excite and sustain an impression which greatly relieves the more prominent symptoms of disease. When we wish to deplete the liver, and promote discharges of bile, a few grains of Calomel may be added to each dose.

Combined with Calomel it forms a very useful and effectual purgative, and from its tendency to deplete the biliary system, and to produce powerful and free discharges from the bowels, it is much resorted to in the beginning of Fevers, or in other derangements of the system. It was the favorite formula of Dr. Rush, in the treatment of Yellow Fever, and in the bilious fevers of our country. The proportions which I prefer employing are 10 grains of Calomel to 15 or 20 of Jalap. This ensures free action upon the bowels, and prevents salivation.

The same combination was also recommended as an anthelmintic, and as a hydragogue, and from its efficacy in dropsy was called the *Panacea Hydropicorum*.

In the treatment of dropsies this combination has been superseded, and in the place of Calomel, the Bi. Tart. of Pot. is substituted. Given in the proportions of  $\text{ʒiij.}$  of the Bi. Tart. of Pot. and 15 grains of Jalap, a very useful cathartic is formed, and from the exhalents of the intestines being excited in a considerable degree, very copious discharges are produced, with an abatement of the dropsical effusions in the cavities of the body. For by evacuating the serous portion of the blood, a demand is made to supply the expenditure from other parts of the system, and the absorbents are therefore excited to a more vigorous action, to supply the deficiency which the purging has produced. Combined with a few grains of *Ipecacuanha* its purgative properties are very much increased.

Triturated with hard substances, as the crystals of Tartar, or sugar, by which it is reduced to a very fine powder, it operates in much smaller doses than when taken by itself, and at the same time it is very mild in its action, and does not gripe. With sugar, especially, it becomes a very safe article for children, which in this form they will readily take, as the Jalap itself has not much taste.



I have already expressed myself upon the value of medicinal combinations, of the good effects of which, this article affords an excellent illustration.

The preparations of Jalap in use, are a tincture, resin and extract. They are prepared according to formulæ to be seen in the Dispensatories.

The Resin of Jalap—Its fracture is shining, its taste at first feeble soon becomes acrid and disagreeable. It is rarely found pure, being often mixed with resins of an inferior value, especially the resin of guaiac.

The resin of Jalap produces the same effect as the powder, but in doses necessarily much smaller. The facility of administering it, in a small volume, and of disguising its taste, and especially the accuracy with which we can measure the quantity of this active principle, might cause it to have a preference in ordinary use to the entire root. In small doses, it excites sometimes colic, and even hyper-catharsis. It is given in doses of 1 to 2 grains to children, and from 6 to 10 grains to adults, united to a powder of a softening nature, as Gum Arabic or liquorice root. It is also united with Calomel, but most commonly employed in the formation of bilious and cathartic pills.

The Tincture of Jalap is a popular preparation.

*Jalapine*.—Mr. Hume thinks that Jalapine exists in Jalap in the proportion of 5 grains to the ounce of the root. Mr. H. having sent a specimen to M. Pelletier, which he designated the Sulphate of Jalapine, that distinguished chemist, after various experiments upon it, concluded that the substance sent was not a salt, but a mixture of acetic acid and resin.

Adulterations—Jalap is sometimes adulterated with the Briony root, but it may be distinguished by its paler colour, and less compact texture.

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*Convolvulus Macrorhizus*.—I have introduced this plant to your notice, not for its medicinal importance, but because it is the plant which has been described by several botanists as that which affords the officinal Jalap. The elder Michaux, a celebrated French Botanist, cultivated it at a small farm in the neighborhood of this city, and specimens were sent by him to the Jardin des Plants, in Paris, where it was figured and described as the plant from which Jalap was obtained. Other botanists have also expressed themselves in similar terms, as Pursh, Persoon, Linnæus, &c. I have thought it right to present it to your notice, and by furnishing you with a drawing and the root of the plant, to form a comparison with the one described by Prof. Coxe, as the real Jalap, and by this means be convinced of the error which has existed on this subject for a long time. The error has been corrected, by the industry and pa-

tience of Prof. Coxe, in cultivating shoots sent him from Mexico, and from them, a description of the plant, with an engraving, has been given, in one of the No's. of the American Journal.

The following is a description of the *C. Macrorrhizus*.

Leaves cordate, simple and lobed.

Root perennial, very large, when old weighing from 40 to 50 pounds.

Stem, twining about shrubs and fences.

Corolla, large, border obscurely 10 lobed, light pink, tinged on the inside with purple.

Not only are the external characters of these plants different, but the medicinal qualities are equally so. The late Dr. Baldwin, of Georgia, experimented with the root, with a view to its medicinal properties, and found that ʒvj. may be taken without any cathartic operation being excited.

In addition, the root contains a great deal of saccharine with a considerable quantity of farinaceous matter. Upon submitting it to analysis, it is found to contain so little resin as not to prevent its being used as an article of diet.

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*Convolvulus Scammonia*, or *Scammony*.—It is the concrete juice of the *Convolvulus Scammonia*, a plant which grows in many parts of Asia, particularly in Syria. The root is the part which furnishes this substance, and it acquires a very great size. It contains a milky juice, which when collected, and allowed to become concrete, forms the substance of which I am speaking.

The following is the method pursued in procuring it. The earth being removed from about the root, the top of it is cut off in an oblique direction, about two inches below where the stalks spring from it. Under the most depending part of the slope, is placed shells or some other convenient receptacle, into which the milky juice gradually flows. It is left there about 12 hours, which time is sufficient for draining off the whole juice—this, however, is in small quantities, each root affording but a very few drachms. It is then allowed to become concrete, by exposure to the air and sun.

The Scammony which we receive is far from being the pure juice. Those who collect it, to increase its bulk, make various additions, as meal, ashes, sand, or other impurities.

There are two sorts of Scammony to be found in the shops. That from Aleppo and from Smyrna. The former is the best, and it is brought to us in light spongy masses, easily friable, glossy, of different shades of colour, from grey or yellowish white to black. That should be chosen which crumbles most easily betwixt the fingers, becomes white on being united with water, and leaves little or no feces upon being dissolved. The Scammony of Smyrna is

less valued,—it is more heavy, hard, and black, and is full of sand and other impurities.

The chemical analysis of this substance, by Bouillon la Grange and Vogel, exhibits the following results—in 100 parts of Aleppo S. there are about 60 grains of Resin, 3 of Gum, 2 of extractive matter, 35 of inert vegetable matter, or an earthy substance. The analysis of the Smyrna S. exhibits less resin, and more earthy and foreign matters.

**Properties.**—This article is one of the strong stimulating cathartics, operating in general quickly and powerfully. It appears to have been well known to the Greek and Arabian physicians, and was not only employed internally, as a cathartic, but also as an external application for scabies, tinea, &c.

It has been used in cases of dropsy, hypocondriasis, worms, and as a cathartic for ordinary purposes, and in many instances has been of decided utility. But it is sometimes unsafe from its violence, and at other times it exerts no action upon the bowels. This would seem to depend upon the intestines being lined with a great quantity of mucus, the medicine in this condition passing through, without exciting any action upon them,—but these different reports of authors may depend upon the variable quality of the drug.

The dose of Scammony is from 3 to 10 grains.

The general properties of this article are drastic and irritating, and it is not possessed of any virtues particularly worthy of attention, or which may not be supplied by others that have been or to be mentioned.

*Family Polygonæ.\*—Rheum Palmatum.*—The next article of which I shall treat is Rhubarb. This name is applied in Pharmacy, to the roots of several species of plants, of the genus *Rheum*. Three species have been considered as furnishing the true Rhubarb of commerce, and they flourish in the eastern parts of Asia, (from whence they are brought,) comprehending the Asiatic provinces of Russia, Tartary and China. Linnæus thought that the Rhubarb of commerce was furnished by the *Rheum Undulatum*, hence he has termed it *Rheum Rhubarbarum*. Again it was thought to have been derived from the *Rheum Compactum*. At present all naturalists agree in considering it as derived from the *Rheum Palmatum*—more recently from the *Rheum Australe*.

All the species of the genus *Rheum* are large herbaceous plants, having a thick compact root. Leaves radical, of a considerable size, petiolated, &c.

\* Polus, many; gonía, angle. From the angular appearance of the stem.



Two species are particularly distinguished—the Rhubarb of China, and of Russia.

The Rhubarb of China, called also Indian, Tartary, and Turkey Rhubarb, is received from China by the way of Canton. It is found in cylindrical pieces, of a dull yellow externally, and covered with a yellowish powder—its texture is compact—marbled with hard veins, of a dull brickdust colour—its fracture is dull and rough—its odour strong and peculiar—its taste bitter—it is gritty to the teeth when chewed, which is attributed to the saline substances it contains—it tinges the saliva of an orange colour—it is heavy, and the powder is of a fawn colour. Each of the pieces is pierced with a hole, through which has been passed a cord, by which they are suspended to the branches of trees, that they may be dried more effectually. As the roots perform a long sea voyage before they reach us, it is not uncommon to find upon them black spots, and partially damaged from moisture. They are then readily attacked by worms. The merchants endeavor to conceal the defects, by stopping up the holes formed by the worms, with a paste made of powdered Rhubarb and water. The fraud, however, is soon discovered. This species is less esteemed than the Russian, though it possesses active properties.

The Russian Rhubarb is produced from the same plant, and cultivated in the same places as the Chinese. It is only so called because it is transported from Thibet, Bucharía, and other places to Kiachta in Siberia, where it is sold to merchants appointed for this purpose, by the Russian Government. It is there examined with great care before it is conveyed to the capital of Russia, St. Petersburg. It is preferred and sells higher than the Chinese.

Rheum Rhaponticum—Characters—It is met with in pieces from 3 to 4 inches in length, and from 2 to 3 in thickness. In appearance it is less ligenous, of a pale colour, a taste mucilaginous and astringent, with a little of the gritty sensation upon being chewed. This species grows upon the borders of the Caspian sea, between the Volga and Uralian mountains. It was the species known to the Greeks.

Rhubarb of Europe.—Characters.—Large pieces, longer than they are thick—odour disagreeable and nauseous—taste astringent, scarcely gritty between the teeth.

Rhubarb, though it has been successfully cultivated in Europe, and this country, still the roots in chemical composition, and in their effects, are not equal to those brought from their native climate. Their cathartic property is feeble, while they have more astringency. This difference partly arises from the age of the root. The English and French are commonly taken up after three years, in consequence of their decaying in the ground. The Eastern is not taken up until the seventh or eighth year of their growth. While the latter therefore possesses a colour more

fixed---a stronger odour---a taste quite aromatic and slightly bitter---the former will be found to have a taste more mucilaginous and herbaceous, and evidently a less degree of strength.

Notwithstanding what I have said of the distinctive characters of the different species, it is very difficult to determine, by the appearance of the roots, their real characters or qualities. Much deception is practiced in selecting and artificially preparing the roots, so that the same species will frequently be sold for E. India, Russia, or Turkey, and command corresponding prices. Dr. Paris states that inferior kinds of Russian, Chinese, and English Rhubarb, are artfully dressed up and sold under the name of Turkey, and he states that a number of persons in London, known under the name of Russifiers, gain a regular livelihood, by the art of dressing this article---by boring, rasping, and colouring the inferior kinds.

Culture of Rhubarb.---Our knowledge respecting the culture of Rhubarb in its own climate, is far from being accurate. All that is known being derived from a company of Bucharian merchants who possess a monopoly of the trade, and who are interested in keeping every thing secret which relates to the plant. Having obtained this monopoly, (from the Chinese government) they export the Rhubarb, on one side into Russia, and on the other into China.

It appears that the plant thrives best in light and sandy soils. The roots are collected twice a year, and those only are selected which have attained the age of 6 years. As soon as they are drawn from the ground, they are deprived of their bark, cut into pieces and suspended on strings, (in order to facilitate their drying,) in places well ventilated, but protected from the rays of the sun. The desiccation is a most important operation, for upon this in a great measure depends the qualities of the Rhubarb, and by this process it loses almost four-fifths of its weight.

A second operation succeeds to this, and consists in cleansing the roots afresh, dividing them into smaller pieces, and piercing them, not merely to suspend them in the air, but to ascertain that internally they were not damaged.

In Canton the root is purchased directly from the agents of this company, by the English and other commercial people of Europe, and it is proverbial that the article is not selected with the greatest attention to quality at this place. On the contrary, the greatest care is bestowed upon that which is forwarded to Russia.

Chemical Analysis.---The Rhubarb of China has been the subject of considerable research to the chemists. The most recent analysis discovers the presence of a particular principle, which gives to it taste, odour and colour, and which is called Rhabarbarine. This principle is yellow, insoluble in cold water, soluble in boiling water, ether and alcohol---2 of a free acid, which

Thompson has called Rheumic—3 of a fixed oil—4 of a small quantity of gum—5 of starch—6 of many salts.

The yellow colour of Rhubarb is much less destructible than many other vegetable yellows. Aquafortis and other acids which destroy the colour of saffron, turmeric, &c., make no change on that of Rhubarb, or at most render it only turbid. It resists the digestive process, and is observed in several of the secretions of the body. A few hours after it is taken, it tinges the urine a high yellow colour,—it may be detected in the perspiration, and also in the milk.

Medical uses—Rhubarb has been long known as a valuable cathartic, and it derives much additional value in being applicable to purposes, for which other cathartics are not adapted. It is not possessed of very active properties, but is gentle in its operation. On this account it is much employed in those cases of disease, where the patients are much debilitated, where the bowels are weakened by a long course of medicines, or when from constitutional peculiarities, other cathartics could not be employed. Being endowed with this most singular combination of medicinal powers, viz., an astringent with cathartic property, its virtues in many cases are much enhanced, and it becomes particularly useful in many of the forms of Intestinal disease. Its purgative quality is also accompanied with a sense of bitterness, which is often useful in restoring the tone of the stomach, when it has been lost, and for the most part its bitterness make it set better on the stomach than most other cathartics. From this view of the properties of Rhubarb, it may be supposed that it is not much employed in Febrile affections of adults, and when an impression is to be made upon the system. It is well adapted to the diseases of the alimentary canal, from simple costiveness, to the higher grades of diseased action, diarrhœas, and dysenteries.

In costiveness, depending upon feeble action of the alimentary canal, or upon the impaired energies of this organ, it is better adapted than the variety of remedies which are resorted to for this purpose, which most commonly confirm the disease they were designed to prevent. It is sufficiently purgative to excite a gentle action, at the same time it does not impair the energies of the primæ viæ, but by its astringent and tonic properties, combined with the purgative, it establishes a habit of action, while it strengthens its functions. It is given in these cases in the form of a pill of 5 grains or more, at bed-time—or the root may be chewed and the saliva swallowed. No practice is more to be deprecated than that of resorting to drastic stimulating pills, with a view of obviating a costive habit of body. The various nostrums for this purpose consist of little else, which being comprised in a small compass, gratify a reluctance so natural to taking medicine at the



expense of the health. For, let it be observed, that though evacuations are excited, yet being purchased by the use of very stimulating substances, the bowels become insensible to minor stimulating impressions, and have at the same time their powers of action impaired. The article of which I am speaking, is subject to none of these objections—while it relieves the bowels, it tends to produce more regularity, by strengthening and giving tone to its fibres. In this affection the utility of habit is strongly exhibited, and while under the use of Rhubarb, it would be advisable to solicit discharges at a particular hour every day.

In Dyspepsia the relief afforded by regular alvine discharges, is confessed by every one afflicted with that disease, and Rhubarb employed in the manner above mentioned is highly useful.

In Hypochondriasis, a disease which often has its origin in the impaired condition of the *primæ viæ*, the utility of regular discharges must be apparent. The slightest attention paid to the origin and progress of this disease, evinces a deranged state of the bodily health in general, and especially of the digestive organs, which having continued for a definite length of time, a state of mind gradually shews itself, distinguished by the following circumstances—langour, listlessness, a want of resolution and activity with respect to all undertakings, a lowness of spirits, sadness, timidity, and with respect to all future events a dread and apprehension of the worst, or of the most unhappy occurrences, often upon the slightest grounds. Were it my province, I could illustrate by the progress of the symptoms the primary source of the mental derangements, but whether my views are admitted or not, the fact is established, that regular alvine discharges are of the utmost importance.

In many cases Rhubarb will be found amply sufficient for this purpose, and I have been assured by a gentleman of great respectability of this city, who labored under this disease to a distressing degree, that nothing he had ever tried, afforded him more relief than discharges by the bowels, procured by taking small doses of Rhubarb.

Lord Byron mentions it of himself, that when a fit of the blue devils was impending over him, a spoonful or two of Epsom salts, always restored his spirits more quickly than the finest wines, and others have confirmed the truth of the remark by their practice.

In Dysentery the utility of cathartics is acknowledged, and Rhubarb by its mildness, is well calculated for the purpose of evacuating the intestinal canal. It should be given in large doses and combined with calomel. The formula which may be employed is *x.* grains of Calomel and *xx.* of Rhubarb. In the more

advanced stages of this disease the following compound may be used with advantage.

R. Pulv. Rhei, xxx. grs. ; Pulv. Ipecac. x grs. ; Gum Opii. iv. grs. ; Syrup, q. s. ; ft. Pil. x. one every 2 hours until relieved.

This formula will be found useful in allaying the uneasiness, tenesmus, and griping which are so distressing.

In Diarrhœa, cathartic medicines become necessary to remove the crudities which have passed into the bowels. Rhubarb is much employed for this purpose, and is particularly well adapted, from the peculiarities which exist in its composition, uniting an astringent with a cathartic property, the former quality becoming apparent when the latter has ceased. On this account when evacuations are required, as most frequently occurs in the early stages of the disease, Rhubarb is considered the most proper article to be employed. After the bowels have been evacuated, the same formula as advised in Dysentery may be resorted to.

The operation of Rhubarb, like that of Jalap, is quickened by the addition of neutral salts and calomel, the purgative powers of which it also reciprocally augments, so that a compound formed of smaller portions of Rhubarb and a neutral salt or Calomel, acts with more certainty, and quicker, than large doses of either taken separately.

In the diseases of Children. Rhubarb is much employed—Combined with magnesia, in equal proportions, it forms a very common cathartic in their bowel complaints and other intestinal derangements. Combined with the alkalies, as soda or potash, it undergoes a change of colour, becoming red, and a very useful preparation is formed in the same diseases. It is particularly useful in those derangements which follow teething, when the bowels perform their functions feebly—when the passages are of a green colour, and the dejections are slimy and curdled. In these cases the compound exerts a gentle cathartic action, neutralises acidity, and exercises a tonic operation. The formula is as follows—

R. Carbon. Pot. gr. xii to ℥i. ; Rhei, ℥i. to ʒss. : water, ʒii. to ʒiii. one to two tea-spoonsful every two hours, with a tea-spoonful of water according to the age of the child, until the symptoms are relieved.

In the treatment of these affections Rhubarb has been employed in a variety of ways, and every nurse professing to treat the diseases of children, has some favorite mode of preparing this article. They are generally hurtful by being combined with heating articles, with a view to dislodge wind, or some other fancied effect which is to be produced. The formula I have given will be sufficient for most cases, and where something more stomachic is re-

quired, recourse may be had to the Tincture. It is prepared after the manner to be seen in the Dispensatories.

Rhubarb tea, prepared in the following manner—

R. Powd. Rhub.,  $\text{ʒii.}$ ; Fennel Seed,  $\text{ʒii.}$ ; water, 1 pint, boil until  $\frac{1}{3}$  is dissipated—the dose  $\text{ʒss.}$  to  $\text{ʒss.}$ , two or three times a day for several days.

This is a valuable article in the early diseases of children, especially in colic, which occurs in the first three months. In this the child suffers night and day, and this preparation succeeds after anodynes have been administered in vain.

Another Formula of considerable utility in Diarrhœa and the Intestinal derangements of children, is as follows :

R. Powdered Rhubarb,  $\text{ʒss.}$

Calcined Magnesia,  $\text{ʒi.}$

Powdered Gum Arabic,  $\text{ʒss.}$

Mint Water,  $\text{ʒvii.}$

Syrup of Morphine,  $\text{ʒii.}$

A table-spoonful for an adult, and a tea-spoonful or less for a child three times a day, until relief is obtained.

Syrup of Morphine is prepared as follows :

R. Acet. Morphine, grs. iv.

Simple Syrup,  $\text{ʒbi.}$

*Official Preparations.*—Ext. Rhæi Præcip.---Mr. Carpenter, a Chemist, in Philadelphia, has prepared an extract by precipitation. The specimen I present you has been so obtained and in this form furnishes, in a concentrated state the properties of Rhubarb, separated from the ligneous and mucous portions, and bears a similar relation to the crude substance that Quinine does to the Peruvian bark. It is of a brownish red color, possessing a slightly styptic, pungent taste, soluble in water, and its odour that of the native Rhubarb. The process for preparing this article is tedious, and I do not think would be recollected by you if detailed, I shall therefore refer you to the 12th volume of the Philadelphia Journal of the Medical and Physical Sciences.

Sulphate of Rhubarb or Rhabarbarine.---This chemical principle discovered by M. Pfaff, and prepared by M. Nani, a distinguished Chemist of Milan, has been obtained from the Rheum Palmatum. M. Nani has described the process by which this article may be obtained in the *Bibliothèque Univer.* February, 1823. He speaks of it as being active in doses of a few grains, and to possess advantages over Rhubarb, from the circumstance of its possessing uniform strength, while the different kinds of Rhubarb have qualities so very various, that in many cases the ordinary doses are unequal. The high terms in which this article was spoken of, induced Carpenter to undertake its preparation, agreeably to the formula of Nani, and upon repeated trials by several physicians it was found by no means entitled to the commendations



bestowed upon it, being in short a very feeble substance, requiring to be given in a larger dose than the precipitated extract above described.

That it was not owing to any imperfection in the preparation was proved by a similar one from the factory of Pelletier being equally as feeble. In short, Rhabarbarine has more the appearance of an extract than any of the vegetable alkaloids. It is solid, dark brown, opaque, possessing the odour of Rhubarb, and a taste slightly nauseous and bitter, it is deliquescent and very soluble in ether and alcohol. As the process for manufacturing the Rhabarbarine is expensive and the product small, it is important that its true principles should be known. These are the most recent and important of the chemical preparations of this article.

Other preparations.---Rhubarb readily yields its virtues to water, proof spirits, and to wine, on which account the officinal preparations of this article are greatly multiplied. The most valuable of these may be seen in Chapman's Therapeutics, to which I would refer you.

All the Tinctures of Rhubarb are purgative and stomachic, but they are not generally used for the first of these purposes, on account of the strength of the menstruum, and are therefore more usually employed as adjuncts to saline purgatives, for giving them warmth, or to stomachic infusions in dyspepsia, flatulent colic, diarrhœa, the costiveness of old people, and of cold phlegmatic habits.

Dose of the powdered root from  $\mathfrak{z}\text{i}$ . to  $\mathfrak{z}\text{i}$ .

From  $\mathfrak{z}\text{i}$ . to  $\mathfrak{z}\text{ss}$ . opens the bowels freely, and from  $\text{vj}$ . to  $\text{x}$ . grains may be given for a dose when its stomachic properties are required.

Rhubarb is often recommended to be toasted with a gentle heat, until it becomes friable, with a view to improve its astringency. This however is not effected, and its purgative property is destroyed.

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*Family Lillacæ*---*Aloe*.---*Aloes*.---The next article of which which I shall treat is Aloes. This is the inspissated juice of the Aloe Plant, a native of Africa, but which is also cultivated in America, Asia and Europe.

A tract of country about fifty miles from the Cape of Good Hope produces in great abundance the Aloe plant, and from this place much of the Aloes of the shops, sold under the name of Socotrine Aloes, is now imported.

The plant is also carefully cultivated in Jamaica and Barbadoes.

There are three varieties of the Aloes, viz; the Socotrine, the Hepatic, or Barbadoes, and the Caballine or Horse Aloes.

The Socotrine so called from being formerly brought from the Island of Socotra, at the mouth of the Red Sea, is the purest and best, and was the only one used in medicine.

It is of a glossy surface, clear and in some degree pellucid in the lump, of a yellowish red colour, with a purplish cast, and when reduced to powder of a golden colour. Its taste is extremely bitter, accompanied with an aromatic flavour, and the smell not unpleasant.

The second species, the Hepatic or Barbadoes, is brought from the Island of Barbadoes, in the West Indies, and from the East Indies. It is in larger masses, of a light colour, has an odour much stronger and more unpleasant than the former, and a taste intensely bitter and nauseous.

The third, or Caballine, is distinguished from both by its strong smell. In other respects it agrees very much with the Hepatic, and is not unfrequently sold in its place.

The three kinds I have mentioned, differ in being the insipissated juice of different species of the Aloe plant. The one used in medicine was the Socotrine obtained from the Aloe Spicata, but the other two are now more or less employed.

The root of the plant is perennial, strong, and fibrous.

Leaves numerous, narrow, tapering, thick or fleshy, succulent, and beset at the edges with spiny teeth.

The flower stem rises to the height of 3 or 4 feet, is smooth, erect, beset towards the top, with bracteal scales.

The flowers are produced in spikes of a purplish or reddish colour.

Corolla monopetalous, and cut into six narrow leaves which separate at the mouth.

Filaments are six.

The extract is prepared in the following manner from the plant. The largest and most succulent leaves are cut off close to the stalk—they are immediately put into tubs, and disposed one by the side of the other in an upright position, that all the loose liquor may ooze out at the wound. When this is thought to be wholly discharged, the leaves are taken out, one by one, passed through the hand to clear off any part of the juice that may yet adhere or stick in the less open veins—the liquor is then put into flat-bottomed vessels, and dried gradually in the sun, until it acquires a proper consistency.

Chemical analysis.—This has been effected by Bouillon La-grange, and others, who have discovered in this substance an extractive principle in a considerable quantity, which by some is termed a gum, and a resinous matter.

The former is intensely bitter, and possesses a faint odour, resembling in some degree that of Saffron, and the cathartic pro-

perty resides chiefly in this substance—the pure resin having little or no purgative virtue.

**Medical Uses.**—Aloes is an article which has long been known in the *Materia Medica*, and frequent mention is made of it by the more ancient writers. By them it was held in much estimation, and there are few articles which have been combined in a greater variety of forms, or the different preparations of which have been more numerous. These, at the present time, have passed into disrepute, and the article meets with but few of those strong advocates, who were often extravagant in their commendations.

Given in doses from 12 to 20 grains, it makes a strong impression upon the alimentary canal, and often excites severe and frequently repeated colicky pains, very fluid dejections furnished by the exhalents, and the intestinal secretions, which this substance promotes.

Its action is principally upon the large intestines, and a feeling of warmth is felt in the fundament after each passage.

Taken in a dose of from 2 to 6 grains, the purgative operation of Aloes does not produce the same symptoms, but its irritating operation acts always in an obvious manner upon the surface of the intestines. It occasions, commonly 8 or 10 hours after it has been taken, one or more passages. If its use is continued for some days, there is soon experienced the same warmth, and even burning in the interior part of the rectum. It is upon this portion of the alimentary canal, that Aloes has its action directed,—that it excites irritation, which is often considerable, and establishes a centre, if I may so say, towards which the fluids are directed. The purgative property of Aloes would alone render it useful in medicine. But there are advantages connected with the operation of this article, which proceed less from this quality, than from the property which it possesses of irritating the interior of the rectum, and of bring to this part an afflux of fluids. It is this derivative or revulsive power which deserves attention in the diseases of the head, chest, and of the organs situated in the upper regions of the abdomen. To obtain this operation of Aloes it is necessary to give it in small doses, from 1 grain to 6 grains, and to administer it morning and evening for some days. The following formula will be found applicable to various purposes.

**R.** Powdered Aloes: Powdered Rhub.; Blue pill mass—each equal parts—made into pills of a convenient size—two of the pills to be taken at bed-time, and another in the morning.

Thus given, it opens the bowels, and evacuates their contents without any uneasiness or inconvenience to the patient. In pains and heaviness of the head, in habitual giddiness and dulness of the mental faculties depending upon this cause, it affords much relief,



and if it does not dissipate these affections, it at least renders them more moderate.

After an attack of Apoplexy, or other diseases in which the functions of the brain are injured, the sensibility of the system is impaired, and the intestinal canal falls into a state of inactivity, the bowels are constipated, Aloes combined as above mentioned, is useful in stimulating the larger intestines into action, and of obtaining alvine evacuations.---*Barbier, Traite Elemen.*

In various affections of the abdominal viscera, connected either with derangements of their secretions, or enlarged and diseased structure, it is also valuable, not only from the moderate evacuations it excites, and which can be continued for days and weeks, but from its alterative operation.

In uterine obstructions Aloes has been much recommended. From its tendency to act upon the rectum, it creates a determination of blood to the pelvic viscera, and in this manner operates in languid and phlegmatic habits in exciting a new discharge of the catamenia. It becomes useful only when the system is in a debilitated state, and where there is inaction of the uterine organ. It is seldom used alone in this case, but combined with the Sulphate of Iron, Myrrh, and other articles, as in the combination called Hooper's Pills.

We may derive an argument in favor of the importance of this medicinal substance from this circumstance, that the compounds in which it entered in a large proportion, have enjoyed a great deal of celebrity. They are the Elixir of Long life---the Sacred Tincture---the Elixir Proprietatis---the Pilulæ Angelicæ &c. The titles of these medicines excites some derision at the present time, but they also prove the value which was attached to these formulæ, inasmuch as they were employed in the general practice of physicians.

Aloes from the smallness of its bulk, and its activity, is very commonly employed in the formation of cathartic pills, and it constitutes the basis of most of the empirical medicines which are sold for this purpose, and as anti-bilious pills, for instance, Anderson's, Lee's, Hooper's, Dixons, &c. &c., and its activity is doubtless much improved by the combinations which are formed. See the different formulæ for these pills, in Paris Pharmacologia.

As patients sometimes prefer pills to other modes of administering medicines, the following formula you will find very useful and sufficiently active.

R. Powdered Aloes, ʒi.; Powdered Gamboge, ʒii.; Tart. Ant. gr. iv.; simp. Syr. q. s. mix and divide into xxiv pills. Three of these pills are to be taken at bed-time, and two in the morning, if the first do not operate.

As a remedy for *Ascarides*, ʒi. of Aloes dissolved in a pint of water or milk, used as an enema, is very useful and deserving your attention—but more of this when we come to the consideration of Anthelmintics.

Notwithstanding what has been said in favor of this medicine, it has been objected to, from its supposed tendency to produce hæmorrhoidal affections. To this, however, I cannot subscribe altogether, as it is more probable that this complaint has originated in the costive habit which has generally existed some time before it is attended to, than to any action exerted upon the rectum. I have known a number of persons who have made use of Aloetic preparations for a long time, without these effects being experienced, and should conceive that where it does take place, the pre-disposition must have existed in a considerable degree. When the disease exists, it would be improper to resort to it, as from its known operation upon the rectum, it may add much to the irritation.

Aloes ought not to be administered during the menstrual discharge, nor in those cases in which there is much uterine irritation, and a tendency to discharges from the uterus, either more frequently, or in larger quantity than is natural.

Official preparations.—These have been very numerous, but at present very few are retained. The most important is the Tinct. of Aloes and Myrrh. The comp. decoction of Aloes. Pills of Aloes and Myrrh.

The dose is from 6 to 16 grains, but if taken daily it should not exceed 6 grains, as in larger doses, when the use of the medicine is continued some days, it is apt to produce symptoms of tenesmus.

*Family Guttiferae.\*—Gambogia, or Gamboge.*—This is the concrete, gummy, resinous juice of a tree growing wild in Cambogia, Ceylon, Siam, and Cochin China, and called by botanists *Stalagmitis Cambogioides*. The juice is collected in drops as it falls from the leaf-stalks, and young shoots, when they are broken from the tree, or by deep incisions in the bark. It is afterwards inspissated by the heat of the sun and moulded into cakes or rolls. It is of a deep yellow colour inclining to an orange, has no smell, and very little taste, but after remaining some time in the mouth, gives a slight impression of acrimony. It is readily dissolved in water, alcohol, and sulphuric ether, and affords one of the best examples of what is called a gum resin. According to the experiments of M. Bracannot, it is composed of 20 parts of gum, and 80 of resin.

Medical uses.—Gamboge is a very powerful cathartic and operates too, very often, as an emetic. Given in a large dose, as

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\* From gutta a drop, and fero I produce.

from 10 to 24 grains, it exercises upon the mucous membrane an impression strongly irritating. The irritating action of this substance upon the mucous membrane is often extended to the muscular coat of the intestines, giving rise to undue and severe contractions of the bundles of fibres which compose it, thus causing what are commonly called colicky pains.

Gamboge in its passage through the stomach often distresses this organ, from whence proceeds the nausea and vomiting which accompany its use. In a more moderate dose these effects are not so strongly exhibited.

In the administration of this article, where we entertain fears of its too irritating operation, it is very easy to unite with it a powder of a softening or tempering nature, as the roots of mallows or liquorice, cream of Tartar, or Gum Arabic. Separating the particles of the Gamboge from each other, these substances act as correctives, and prevent an impression from being made upon the digestive organs, too great or too long continued.

From the active cathartic properties of this article, it has been much employed in fevers. It was much esteemed by the late Dr. Rush, and by him recommended in the treatment of Yellow Fever, with the view of bringing on an artificial cholera morbus. He considered this disease to partake of the character of a bilious affection, and on this principle the practice mentioned was established. It is now distinctly understood to be an inflammatory affection of the stomach and intestines, for which the less drastic cathartics are better adapted. It is therefore very properly abandoned in most of these cases.

In Dropsy, it has also been much used, combined with cream of Tartar, or Jalap; and in this manner it produces very copious alvine discharges. But it is too violent for the generality of these cases, which will not support the excessive and debilitating discharges produced by this medicine.

A very good cathartic in the advanced stages of this disease, is formed by dissolving this article in Sulphuric Ether,—its stimulus supporting the system under the rapid depletion which takes place by the bowels.

From its peculiarly drastic effects, Gamboge has been much extolled as a remedy for worms, its operation being supposed sufficient to occasion their expulsion, or to remove from the intestinal canal the mucous which it contains, and which forms a nidus for their production.

It is a very useful practice to administer some anthelmintic medicine before recourse is had to this purgative. The remedy of Madame Nouffer against the Tænia, furnishes us with a very useful article.

Giving ʒiii. of this medicine, or the male fern in powder, and a



few hours after, when the worms have experienced its deleterious influence, a bolus, in which Gamboge is the chief ingredient, will be found very efficacious.

It is easy to perceive the advantages which will attend this practice, since in addition to the effects which follow a drastic cathartic upon the worm, we have added the influence which the fern itself is capable of producing. The Tape worm, in speaking of this article, is selected, as it is confessedly the most difficult to remove—with the other species, our success may be more conspicuous, as the milder cathartics are adapted to every purpose.

The usual dose of Gamboge is from ii. grains to xii. and it is commonly given in the form of pills.

Gamboge, as well as Aloes, enters largely in the formation of cathartic or anti-bilious pills, as they are called. The two articles modify the action of each other, and hence they are generally combined. When speaking of Aloes, I gave you a cathartic formula; a very good one is the following—

R. Gamboge—Aloes—Calomel each ʒi. m. and divide into lx. pills ii. to iv. a dose.

The compound pills of Gamboge, which are often a convenient purgative, are prepared in the following manner—

R. Gamboge powdered; Aloes powdered; Cinnamon powdered, of each ʒi.; hard soap, ʒii., mix the powders, then having added the soap, beat the whole together until they are thoroughly incorporated.

The dose is v. grains to ʒi.

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*Family Cucurbitaceæ.\*—Cucumis Colycinthis*—Called also Coloquintida, and Bitter Cucumber—is a plant of the gourd species, growing in Turkey.

Root annual.

Stems slender, trailing, scabrous, with short hairs.

Leaves petiolated, deeply and obtusely sinuated, green above, whitish, and clothed with short hairs underneath.

Flowers small, yellow, axillary, solitary.

Fruit, which furnishes the medicine, is of the size of an orange, divided into cells, abounding with pulpy matter, separated every where by cellular membranes, and including many oval compressed seeds. The spongy membranous part of the fruit is directed for medicinal purposes, the seeds being comparatively inert. To the taste it is nauseous, acrid, and intensely bitter.

Colocynth is a very active cathartic, and as such was well known to the Greek and Arabian physicians. It was frequently

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\* From cucurbits, a gourd.

employed by them in different diseases, though not without an apprehension of danger from the violence of its effects, of which instances are related. To these I might add another, in which from the use of this article the most distressing effects were produced. These were severe griping and rending pains in the abdomen, particularly referred to the region of the epigastrium, with a sense of great internal heat, coldness of the feet and hands, and skin generally. To these were added severe muscular contractions of the hands and fingers, insomuch that they could not be employed. In short, an enteritis of the most violent character was produced, which only yielded to free V. S. warm bath, warm applications, anodynes, the oily preparations, &c. I must therefore caution you against using it in this state.

The preparation used, was formed by infusing one of the Cucumbers in a pint of spirits—the dose  $\mathfrak{z}\text{ii}$ . to  $\mathfrak{z}\text{ss}$ . The first dose not operating, a second was taken soon after, and with the effects described.

The diseases in which this article is recommended are, Mania, and Melancholia, in both of which very powerful medicines are required to rouse the sensibilities of the system, and it was in these cases that the ancients recommended it. It is used in various other affections of the brain, as in coma, and apoplexy, and from the powerful impression which it makes upon the intestinal canal, it no doubt operates favorably in relieving the undue determinations to this organ.

Colocynth, I would state, should never be given alone, but in the form of extract, with other articles, and in this manner only would I recommend it.\*

It is considered by Dr. J. Johnson, in combination with calomel, as one of the most effectual purges we possess, for evacuating the bowels freely, and correcting the functions of the biliary system. The formula he recommends is as follows:

R. Ext. Colocynth  $\mathcal{C}$ .  $\mathfrak{z}\text{i}$ . ; Proto chloride Mercury, xv. grains; Tart. Antimony, i. grain; Ol Carui, gtt. v., make into a mass, and divide into xxiv. pills. The dose is 1, 2, or 3 every night.

Another formula for the same purpose, and in all those cases where with the evacuant, we wish the alterative operation of cathartics, is as follows:

R. Ext. Colocynth Comp.  $\mathfrak{D}\text{iv}$ . ; Ext. Hyosciamus,  $\mathfrak{z}\text{ss}$ . ; Blue Mass,  $\mathfrak{D}\text{i}$ . m. and divide into xxx. pills,—ij. to be taken at bed-time.

Many attempts have been made to correct the virulence of Colocynth, by acids, astringents, &c., but these have not succeeded. The best method of abating its activity without diminishing

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\* In combination with other cathartics, it loses much of its violence, but retains its purgative energy.—Wood & Bache.

its purgative virtue, seems to be by tritulating it with gummy farinaceous substances, as the oily seeds, which without making any alteration in the Colocynth itself, prevents its resinous particles from cohering to the surface of the bowels, so as not to irritate or inflame them. My advice would be not to employ it, except as I have mentioned in the form of extract.

The dose of Colocynth in substance, is from 4 to 6 grains, and of the compound extract much the same.

The compound extract is prepared by digesting in proof spirit, Colocynth, Aloes, Scammony, and cardamom seeds, and afterwards evaporating the tincture to the proper consistence. This is a very certain and powerful purgative, and generally operates without much griping or inconvenience.

*Momordica Elaterium*—*Wild, or Squirting Cucumber*.—This is the *Cucumis Agrestis* of some, and the *Momordica Elaterium* of other botanists.

The plant is rank, rough, spreading, hairy, with round thick branches, destitute of tendrils.

Leaves, heart-shaped, rough.

Flowers, dull yellow.

Fruit, pendulous, elliptical, blunt at each end, two inches long, green, rough, with innumerable small bristles.

The plant is nearly allied to the cucumber and melon, and the fruit is the part used. When ripe, the fruit upon being touched bursts open with great force, and throws its contents to a considerable distance, hence the name *Squirting Cucumber*. It is a native of the South of Europe, and flowers in June and July. All parts of the plant are bitter and strongly purgative, but the dried acrid juice, or fecula of the fruit, known in the shops by the name of *Elaterium*, is the only part medicinally employed. The method of preparing it is the following :

The ripe wild cucumbers are cut up, and the juice pressed through a sieve, into a glass vessel. This is then set by to settle, until the thicker part has subsided. The thinner is poured off, and the thicker which remains, is filtered, covered with a linen cloth, and dried with a gentle heat. It differs in power according to the care taken in the preparation—for it sometimes happens, that the juice contains some portions of the fruit, which is inert, and which will lessen its activity.

From certain experiments of Dr. Clutterbuck, it appears, that the quantity of active matter contained in the fruit, is so extremely small, that only six grains were procured from forty cucumbers. The active principle is of a resinous nature, and so heavy as to sink in water. To this the name *Elatin* is given.



Elaterium is a very powerful cathartic, and is classed among the most active of the *Materia Medica*. It ought therefore to be administered with great caution, and only when the milder preparations have failed.

It was much used by the ancients in cases of Dropsy, and by subsequent writers it has been highly commended. Its good effects in these cases, depends not only in increasing the peristaltic motion of the intestines, but in augmenting the whole of the enteric secretions—so that the alvine discharges, resulting from the operation, far exceed in quantity those which are produced by any known purgative. Such is the powerful influence which this medicine exerts on the first passages, that doses from the  $\frac{1}{4}$  of a grain, to one grain, taken night and morning, will induce and sustain a cathartic action, that will remove from the system, through the intestines, from two to four quarts of fluid, in the 24 hours.

Elaterium does not produce its full effects as a Hydragogue, until it has been taken for several days, when its specific or peculiar action becomes established, and will continue uninterruptedly, as long as may be judged right to persist in its use. Acting as it does thus powerfully in evacuating the effused fluids in the cavities of the body, it seems to exert no action upon the kidneys. Its cathartic operation is so intense and direct, as almost necessarily to confine its undivided power to that sphere of action.

In Hydrothorax particularly, it has been recommended by Dr. Ferriar. Its powers, he says, in removing serous accumulations in the cavities of the body, surpass those of any other medicine; and the astonishing relief it affords in the dyspnœa occasioned by Hydrothorax, or ascites, even in persons of the most advanced age, must place it in the first class of Hydragogues.

The sensible effects of Elaterium are severe and constant nausea, frequent stools, and in considerable doses, vomiting. It does not uniformly increase the urine. Dr. Ferriar relates 15 or 20 cases in which this article was employed—in most of them, cures were effected, and in all great relief was afforded. It is really consolatory to find such testimony in favor of this article, in a disease so distressing and usually fatal—but I regret that in my trials with it, I cannot confirm the above statement. I have employed it in two cases, but with no permanent advantage. The dose to begin with, is from  $\frac{1}{4}$  to  $\frac{1}{2}$  a grain in the morning, which may gradually be increased to 6 grains.

It has been suggested, that this medicine may prove an efficacious alterative remedy in obstinate diseases of long standing, but with what success it may be employed, has not yet been ascertained.

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*Carbo Ligni—Charcoal.*—Is the carbonaceous part of vegetable substances, obtained by exposing them to heat, till the volatile

parts are dissipated, and excluding the air sufficiently to prevent their entire combustion. This article has for some time been known in the *Materia Medica*, but for various reasons has not been held in the estimation which it probably deserves. Its properties are various. As a cathartic it has been employed by several physicians, but its virtues in this respect, have been more particularly considered by Dr. Daniell, of Savannah, and by him spoken of in high terms, in cases where medicines of this class are required, and with peculiar good effects in obstinate constipation. It is given in these cases in very large doses, a table-spoonful every hour or two. It has this particular good quality, that it will remain readily on the stomach, and in some instances seems calculated to allay irritability of this organ. For this purpose it has been employed, and has been spoken of very favorably, and particularly in that irritable state which attends the concluding stages of Yellow Fever.

It has been much used of late, in derangements of the digestive system, and much relief has been afforded by its use. Persons, in these diseases, who are distressed with head-aches, sore mouth, acid eructations, confined bowels, &c. have been much relieved. These complaints are of frequent occurrence with delicate females, who from feebleness of constitution, and sedentary habits, are afflicted with the above symptoms. A tea-spoonful of finely levigated charcoal, taken 2 or 3 times a day, in water or milk, I have found very beneficial, exerting the very favorable influence of removing these symptoms and keeping the bowels regular.

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### *Mineral Cathartics.*

Having completed the consideration of the Vegetable Cathartics, I shall next proceed to those derived from the Mineral Kingdom. These are but few in number, and the most important is the

*The Proto Chloride of Mercury, or Calomel.*—It is also known by the names Sub Muriate of Mercury, Mercurius Dulcis, Aquila, Alba, &c.

It is prepared by triturating together in a marble mortar, Perchloride of Mercury, and purified quicksilver. This is placed in a Florence flask, or other vessel, sublimed with the heat of a sand bath, and washed with distilled water. The object of washing it, is to separate any portion of the Perchloride of Mercury or Corrosive Sublimate which it may contain. When first sublimed it is of a yellowish white colour, which deepens upon exposure to light. To improve its colour and purify it further it is again sublimed—reduced to powder, and again washed with distilled water.

It is without taste, or smell, and is nearly insoluble. Lime water and the alkalies decompose it, by abstracting a portion of chlorine, forming a black, or protoxide of Mercury.

**Medical Uses**—Calomel is more generally used, and is adapted to a greater variety of cases, than all the other preparations of Mercury. It is unquestionably one of the most valuable articles of the *Materia Medica*. Under different forms of administration, it is Emetic, Cathartic, Sialagogue, Alterative, Expectorant, and Anthelmintic.

It is, however, more particularly as a cathartic, that I am to consider it in this place, and there is hardly a case, in which it may not be given alone, or in combination, so as to meet the several indications. It has, too, the singular property of imparting force to the mild, and moderating the severity of the drastic medicines.

It commences its operation higher in the alimentary canal, than most other cathartics, and is well calculated by determining downwards, to relieve the stomach, and to deplete the liver and the other chylopoietic viscera. Hence its value in Fevers, particularly in those called Bilious, when the secretion is greatly increased and apt to accumulate in the upper portion of the intestines, producing great anxiety, langour, and oppression.—Calomel, therefore, by commencing its operation in the upper portion of the intestines, is well calculated to relieve these symptoms.

In the Bilious and other Fevers of our climate, it is useful, not only by its cathartic properties, but by its disposition to correct the secretions of the liver, increasing them when sufficient, and lessening them when in excess. It has too the valuable property of promoting the operation of other cathartic medicines, without exciting any additional irritation, or rendering them liable to act with violence. It is, therefore, combined with them with advantage, and greater benefits are derived, than from employing single medicines.

Combined with Emetics, particularly Ipecacuanha, it renders their operation milder and more effectual.

No cathartic is more easy of exhibition. From its small bulk, and its insipidity, it may be administered in many cases, in which other cathartics could not readily be employed. In irritable conditions of the stomach, when others would be rejected, this may be exhibited with the utmost advantage.

In the diseases of children it is highly useful, as it may easily be disguised, and in addition to the smallness of the dose, operates mildly, and with little or no danger of salivation. Dr. Chapman, in speaking of the use of Calomel in the diseases of



children, is convinced, that its operation is milder on them, than on adults.

When long continued in diseases, it will salivate, and this whether it purges or not.

It is a common opinion, that to produce salivation its purgative effects must be restrained. This, in many cases, is correct, for salivation is retarded by the mercury's passing off by the bowels,—but it sometimes happens that patients are most easily salivated, whose bowels are most susceptible of its purgative operation.

The best rules that I can lay down with a view to prevent salivation are,

1. To avoid giving calomel in large doses on two successive days, without employing some other medicine, in order to remove it from the system.

2. It should never be given in frequent doses, when there is but little diseased action, for the system seems more susceptible of salivation when the excitement is not much above the healthy state.

3. Salivation is prevented by combining six or eight grains of Calomel, with about three times the quantity of Jalap, or some other vegetable cathartic.

These rules are of some consequence. Salivation is always painful, and very distressing to convalescents, and I am disposed to think that the good effects of Mercury may be obtained without being carried to this extent. But I shall consider this subject more at large hereafter. This is all that is necessary to be said as to the purgative property of this medicine. Under the head of stimulants, I shall again speak of it as an alterative, and in this capacity it exhibits no less invaluable properties.

The dose, as a cathartic, is from v. to x. grains. For children, from iii. to v. grains.

It is somewhat remarkable, that this medicine, though given in larger doses, has not its purgative effect increased. The late Dr. May, of Maryland, took eighty grains, without more than three or four evacuations, and with effects not more violent than from a dose of twenty grains. A large dose is also less liable to be rejected.

It should be exhibited either in pills, or mixed with some tenacious fluid, as syrup, or thick mucilage. From inattention to this circumstance, the calomel is often lost in compound powders, by its subsiding to the bottom of the spoon, or other vessel employed.

If calomel is ever violent in its operation, it is occasioned by the mixture of a portion of Corrosive Sublimate with it.

*Sulphur*.—Is a simple combustible substance, the product of volcanic countries. It is usually found combined with Iron, forming what is called Pyrites, and with various mineral substances. From these it is separated by exposure to heat, and the Sulphur which sublimes is collected. This is afterwards cast into moulds, and forms the roll Sulphur of commerce. For medicinal purposes, the sublimed Sulphur only is used, and this is prepared by heating in a sand-bath an earthen cucurbit, charged with roll Sulphur, and collecting the vapors in proper vessels placed round it, where it concretes. It is washed in boiling water, to remove from it any portion of acid which may have been formed during the process. It is of a bright yellow colour, but has little taste or smell, and is very inflammable.

Medical uses.—Taken internally, it produces effects which it is proper to distinguish. These may be considered as they relate to the alimentary canal, or the general system. Given in a pretty large dose, as a drachm or more, it is a mild and gentle cathartic, having its action principally exerted upon the lower part of the alimentary canal. From its mildness, and from its stimulating the larger intestines, chiefly to a discharge of their contents, it becomes a useful article in costive habits, and with particular good effects in those afflicted with hæmorrhoids, as it promotes alvine discharges, without those straining or bearing down efforts which exert so bad an influence on these tumors.

It is usually combined with magnesia, in equal proportions, and the preparation called Sulphur Præcip. or Lac Sulphuris, is preferred—a drachm of each is sufficient for this purpose.

Given in smaller doses, and continued at an interval of several hours, it exerts an influence on the general system. It renders the pulse more frequent, and excites the cutaneous secretion. Sulphuretted hydrogen gas, is evolved by means of the combination which it forms, with the alkaline substances in the fluids of the body. The gas is exhaled from the surface of the lungs and the skin. The urine and milk also become affected with the same. It is also well known that pieces of gold or silver, carried about the person, become of a dark or black colour.

From its effects upon the general system, it has been employed in the treatment of Intermittent Fevers.

I have frequently employed this article in Intermittent Fevers, given during the intermission, and I think I may say, I have uniformly derived good effects. Its beneficial operation is soon manifested, and a suspension of the disease follows. Of many cases which have fallen under my notice, I do not recollect being unsuccessful in a single instance. In a little girl about 10 years of age, in whom the disease continued sometime, and refused to yield to emetics, frequently repeated before the paroxysm, to bark, and

the Fowler's mineral solution, I had recourse to Sulphur and the disease was arrested.

The dose is from  $\text{ʒi.}$  to  $\text{ʒiii.}$  3 or 4 times a day, mixed with a little milk, and taken with brandy.

From the decided action which it exerts in the production of perspiration, its use has been extended to the treatment of Chronic Rheumatism, Atonic Gout, Catarrhs, and other pulmonary affections, unattended with acute inflammatory symptoms. In the former case, it is usefully combined with the Gum Guaiac, and in the latter, with the Pulvis Antimonialis, or some other diaphoretic.

Sulphur was, at one time, much celebrated in arresting the progress of mercurial action, but, for this purpose, it is wholly insufficient; Salivation being a disease, which after it is established, will run its course. Its progress may be mitigated by anodynes principally, and perhaps the use of blisters.

But it is principally in the treatment of diseases of the skin, that this article exhibits its best effects. In these cases, its internal use is recommended, as well as its external application to the diseased part. Thus in Scabies or itch, the ungt. Sulphuris, is rubbed on the skin, and the powder is taken in purgative doses—but, as the ointment produces a very unpleasant odour, other applications have been substituted, as Sulphuric acid mixed with lard, in the proportion of  $\text{ʒii.}$  of the former to  $\text{ʒi.}$  of the latter, or it may be employed in the form of wash, with equally good effects, in the proportion of a drachm of the acid to  $\text{ʒviii.}$  of water.

Sir J. Pringle recommends the following formula, which will be found useful in speedily arresting the progress of the complaint.

$\mathcal{R}.$  Flowers Sulphur,  $\text{ʒi.}$

Powdered Hydrochlorate of Ammon,  $\text{ʒi.}$

Lard,  $\text{ʒiiss. m.}$

This quantity serves for four inunctions, and the patient must be rubbed every night. Although the itch may be removed, by the above quantity, yet it will be proper to renew the application, and to rub the parts most affected for some time longer, until a second or third quantity be also exhausted. It is also proper to subjoin its internal use.

The same ointment will be found useful in Tinea Capitis.

The usual dose of Sulphur is from one to three drachms, it may be mixed with syrup, treacle or milk.

Besides this mode of employing Sulphur, it has lately been introduced as an external application in the state of vapour, in several diseases of the skin, and in chronic and long protracted diseases.

This mode of applying it was introduced by Dr. Gales, of Paris, in the treatment of Scabies, upon the supposition that the disease



had its origin in animalculæ, and that Sulphur, applied in the state of vapour, in which state it was not Sulphur, but sulphurous acid gas, would be more destructive to them than its simple application, and of course the cure would be completed in a short time. After trying several plans of applying the fumes of Sulphur, subjected to many inconveniences, they have all yielded to the more convenient and efficacious method, of having a bath or fumigating chamber made perfectly tight, into which the Sulphur is introduced, after having been volatilized outside. The patient being seated naked within, has his body completely surrounded by the fumes, the head being the only part freed from their action. Various forms of disease have been found to submit very readily to this operation—these are Scabies, Herpetic affections of one or two years continuance, which have resisted a variety of local applications—Herpetic ulcers, connected with a scrofulous habit—Paralysis, universal and partial—glandular swellings—chronic rheumatism.

The success which attended the application of the fumes of Sulphur, was confirmed, by a report of a committee of the most distinguished physicians in Paris, and the beneficial effects which have been conferred upon the human species, by its introduction into camps and hospitals, has been truly great. The practice has been fully tested in this country, and the conclusions which have been formed have been nearly equally favorable. Upon the whole, we may consider this mode of applying Sulphur, in cutaneous affections, and in protracted diseases, one of the happy discoveries of modern times, for ameliorating the amount of human suffering. The only inconvenience attending its use is, that the skin becomes irritated after being employed several times, particularly about the scrotum and thighs, with a peeling off from the surface of the body, requiring its use to be discontinued, until the parts have recovered themselves.

The great advantages of sulphurous vapour baths, have been pointed out very fully by Dr. Gales of Paris, Assalini of Naples, and De Carro of Vienna, and their utility is so generally confessed, that I cannot but hope the remarks made will be recollected—not only should they be borne in mind, but the manner of applying them, with the construction of the chamber.

Sulphur combined with the alkalies, forming Sulphurets, is another very valuable article in the treatment of cutaneous diseases. Thus combined, it forms the substance which was called Hepar Sulphuris, or Liver of Sulphur. It is used as a wash in Tinea Capitis, or Scald Head, a complaint very common among children, and often very obstinate. It forms one the best applications in these cases, prepared as follows—

Sulphuret of Potash, i. to zii.

Water, ℥viii. m.

The head is first to be washed well with soap and water, and the wash applied twice a day. I have seen some disagreeable cases cured speedily after this manner.

The Sulphurets are also employed in the formation of baths, in the treatment of other cutaneous diseases. In this form it is much esteemed at the present time, and we are indebted to Dr. Alibert for the important benefits which have been derived from its use. The practice is at present in much repute in England, being employed in the large cities in France, and all the charitable institutions of that country. The bath is prepared in the following manner.

Take ℥ii. of the dry Sulphuret of Potash dissolved in ℥viii. of water.

To this is added the Liquid Hydrosulphuret of Potash, ℥viii.

Also, of the Liquid Sulphuret of Lime, ℥viii.

Of this solution, ℥ii. are sufficient to give to an ordinary bath sufficient strength, and the quantity may be increased to ℥iiss.

Thus applied, it has been found of great utility in the treatment of Ring worms, herpetic affections, and other obstinate cutaneous diseases.

It is not only in these cases that the baths of which I am speaking, have been found useful—but their use has been extended to the treatment of Cachectic diseases in children, in enlarged and indurated conditions of the Lymphatic system, in scrofula, rheumatism, &c.

They exhibit a local action, which is very evident when the skin is in a state of disease. It gives to it firmness, and softness; develops its tone and vital energies.

Besides these forms of employing Sulphur in diseases, it is of considerable efficacy in the state of Mineral Waters. Sulphurous waters are very abundant in many parts of our country. They are generally clear when taken up, and emit air bubbles, which consist of the Sulphuretted Hydrogen Gas. Their smell is very strong, sulphurous and fetid, like that of a foul gun barrel—a taste nauseous and bitter, though it is remarkable that most persons soon become reconciled to it. These waters have been much celebrated in cutaneous affections in general, and in scrofula. They are applied externally in the form of warm bath, as well as taken internally. They have also been recommended in bilious complaints, dyspepsia, general want of action in the alimentary canal, and calculous cases. They are in short useful in all those complaints that require purgatives, and at the same time are benefitted by sulphur. These waters are taken in the morning, in the quantity of a pint and a half to four pints, at moderate intervals.

The officinal preparations of Sulphur, are the Sulphur Præcipitatum, Lac Sulphuris, or Milk of Sulphur. It is prepared by boiling fresh burnt lime and flowers of Sulphur, then filtering the liquor through paper, and dropping into it as much muriatic acid as may be sufficient to precipitate the Sulphur. Wash this repeatedly with water, until it becomes tasteless.

*Carbonate of Magnesia.*—This article was first sold as a Panacea, by a canon at Rome, in the beginning of the seventeenth century, under the title of Magnesia Alba, or Count Palma's powder. It was, for several years, a celebrated secret in the possession of particular persons, until the method of preparing it was made known by Lancisi, in the year 1717, and afterwards by Hoffman, in 1722. It is not found pure in nature, but exists abundantly, combined with many acids, and from these it is obtained by various processes.

It is most usually obtained from the Bittern which remains after the crystallization of common salt from sea water. The Bittern is heated, a solution of common pearl-ash is added, carbonate of magnesia is deposited, and afterwards separated from the liquor by a linen strainer. In this process, the sulphate of magnesia in the bitter water, is decomposed by the carbonate of Potash; by mixing together concentrated and hot solutions of each—a double decomposition takes place.

Also obtained in a large quantity from the mineral called Dolomite, which is a carbonate of lime and magnesia.

Common carbonate of Magnesia, in its pulverulent, is excessively light, and lies so loose, that a smaller weight of it will fill a bottle of a given size, than almost any other known powder. It consists of water, carbonic acid, and magnesia, in proportions somewhat varying. The quantities of each have been thus estimated. By calcination in a full red heat for an hour, both the water and carbonic acid are expelled, and the loss is estimated at about fifty-five per cent. When quite freed from water and carbonic acid, the magnesia that remains, is the magnesia usta, or calcined magnesia of the shops.

Magnesia is an article of much utility in medicine. Its purgative operation depends upon its meeting with an acid in the stomach, by which a neutral salt is formed. When no acid exists it is nearly inert. On this account it is not a very certain medicine, but it is resorted to chiefly by those who are troubled with much acidity. It is under these circumstances a useful antacid, and a safe and mild laxative, in doses of one or two drachms.

The carbonate of magnesia, in consequence of the disengagement of carbonic acid gas, which takes place in the stomach,



is productive of unpleasant symptoms, as flatulency, griping, and other uneasy sensations, especially in weak bowels. On this account the calcined magnesia is preferred, and particularly when it is administered to children.

The calcined magnesia is prepared, by exposing the carbonate to heat for a certain time, by which the carbonic acid gas is expelled, and the article is in a state nearly of purity. By this process it is found to be equally purgative, when given in half its former dose. It is deprived by this process of the disagreeable qualities above mentioned, and acquires also new properties which render it likely to answer some other important practical purposes.

By calcination, it is not only rendered incapable of generating air in the stomach and bowels, but it is qualified to absorb, or render fixed, that which it finds there, and which is produced sometimes in too great quantities in the process of digestion. With children, in whom acidity in the first passages frequently prevails, who are often distressed with cramps, and colicky pains, from the production of wind, this article is eminently useful, and for the reasons I have given should always be calcined, otherwise it may aggravate the symptoms it was designed to relieve. From it a valuable medicine is prepared called Dalby's Carminative, which from its efficacy and general employment should be known to you. The formula may be seen in the Dispensatories, or in Parls' Pharmacologia.

This you will find of great utility in relieving the griping pains, flatulency, and uneasiness to which children are subjected at a very early period of life.

Another formula of much advantage is one recommended by Dr. Dewees, in the colicky complaints of children. It is as follows :

Calcined Magnesia,  $\mathfrak{z}$ i.

Water,  $\mathfrak{z}$ i.

Tinct. Assafœtida, gtt. lx.

Laudanum, gtt. xx.

Twenty drops are a dose. If not relieved, to be repeated in an hour or two. This preparation is, I think, inferior to the mixture of the carbonate of soda, or potash and rhubarb, mentioned a short time since.

Magnesia is very frequently combined with rhubarb, in the treatment of Diarrhœas and other complaints.

Besides these diseases, it has lately been introduced in the treatment of calculous complaints, and in some cases with great benefit. Of its use in these diseases I shall speak on a future occasion.

Dose for a cathartic is  $\mathfrak{zss.}$  to  $\mathfrak{zii.}$  Its most convenient vehicle water or milk.

The habitual or long continued use of Magnesia, has sometimes occasioned distressing symptoms from its retention in the bowels. A remarkable instance is related, of a person who was in the habit of using this substance in large quantities for a considerable time—after his death, it was found accumulated in the colon, having undergone little or no change by the action of the vital powers.

Magnesia is an excellent article in cases, where the mineral acids have been taken in a large quantity, either by accident or design. It combines immediately with the acid, deprives it of its acrimonious properties, and is converted into a saline substance by no means deleterious.

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#### NEUTRAL SALTS.

Are a class of medicines intermediate in their operation between Laxatives and Purgatives. They are more powerful than the first, and less acrid and stimulating than the last. By their stimulus they excite the exhalent vessels of the intestines to pour forth a large secretion, by which the contents of the bowels are reduced to a fluid consistence, and the general system depleted. From not exerting an action upon any particular viscus, they seem adapted only to evacuate the contents of the bowels, and to reduce the general tone of the system. Hence their utility in inflammation, or topical congestion; and from their effects in allaying action, and reducing the heat of the system, they have been called cooling medicines.

Of these the first in importance and power, is the Sulphat of Soda, or Glauber's Salts.

This article is prepared from the saline residuum of several chemical processes, particularly after distilling muriatic or hydrochloric acid, from chloride of sodium by sulphuric acid.

This is one of the most common and useful of the saline cathartics. It evacuates the bowels speedily, effectually, and without pain, heat or inconvenience. It contains a large quantity of water of crystallization, from which it is separated by exposure to the air. By this means, it is reduced in bulk and weight, in consequence of which a smaller quantity will be effectual as a dose.

The objection to this saline preparation is, that while it is more active, it is more nauseous than the rest. There is no method of disguising its taste—it is less disagreeable by being taken in a little water, but it is also less active. The activity of saline medicines generally, seems to depend upon their being dissolved in a large quantity of water. It is upon this principle we explain the

action of many preparations, as Seidlitz powders, sea water, &c., in which the active ingredients are largely diluted. The unpleasant taste of this salt is, however, said to be much diminished by holding brandy in the mouth previous to taking it. The usual dose is an ounce.

An excellent febrifuge mixture is prepared in the following manner.

℞. Glauber's Salts, ℥ii.

Tart Antimony, grs. ii.

Lemon juice or vinegar, ℥i.

Water, ℥viii. m. ℥ss. to ℥i every two hours until it operates.

In this form it not only opens the bowels, but is diaphoretic.

*Sulphate of Magnesia*—Is found native, and in combination with Gypsum. It is also prepared by evaporating the water of Mineral springs, as Epsom springs in England, whence its name is derived. But it is now principally obtained from the liquor remaining after the crystallization of Chloride of Sodium from sea water. The bitter water is boiled down, until on cooling, in clear and cool weather, it affords the Sulphate of Magnesia in acicular crystals, in the proportion of 4 or 5 parts to 100 of common salt, obtained from the same water.

This is a more pleasant medicine than the preceding. It is mild in its operation, and agrees better with the stomach, from its bitterness, than the other preparations. The remarks made upon dilution are application here. Dose, ℥i.

Sulphate of Soda is often substituted for this salt, which it may be made to resemble, by stirring it quickly at the moment it is about to crystallize. The fraud may be detected by adding to the solution of the suspected salt, a little of the Carbonate of Potash—if it is Sulphate of Magnesia, a precipitate of Carbonate of Magnesia will be formed, proportioned to the purity of the article, and Sulphate of Potash will remain. If Sulphate of Soda, no precipitation will take place. When it is necessary to aid the action of the saline medicines with other articles, the following preparation, known under the name of the black draught, may be employed.

Sulphate Magnesia, ℥ss.

Infusion Senna, C. ℥iss.

Tincture Senna, ℥i.

Syrup Ginger, ℥i., mixed as a purgative draught.

*Phosphate of Soda*.—Is a medicine lately introduced into practice. It is said to be less unpleasant in its taste, and to be a good substitute for the other neutral salts, particularly when there is



any tendency to nausea. As it, however, possesses no particular advantages, I need not dwell longer upon it.

Preparation.—The usual process is to add Carbonate of Soda in excess, to the impure phosphoric acid. The solution is filtered, and crystals are obtained by slow evaporation.

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*Tartrate of Potash and Soda.*—Commonly called Rochelle Salt. It received its name from being introduced into practice by an Apothecary at Rochelle, whose name it long bore, Sal de Signette. It is formed by adding Soda to a solution of the Bi Tartrate of Potash, by which the excess of Tartaric acid is neutralized, and a triple salt, Tartrate of Potash and Soda, is formed. It is less agreeable than the Phosphate of Soda, but more so than the Sulphate. It requires to be given in a larger dose.

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*Sulphate of Potash.*—This salt is called in medicine Sal Polychrest, and in the old chemical nomenclature, Vitriolated Tartar. It is formed by directly adding sulphuric acid to a solution of Potash, until the mixture is neither acid nor alkaline. This mixture, on evaporation, affords crystals which are larger, and more complete, according to the slowness of the evaporation.

The taste of this salt is rather bitter, and it is not very soluble in water.

Sulphate of Potash acts as a gentle aperient, in doses of 30 or 60 grains. In the dose of ʒv. or ʒvi. it acts as a mild cathartic—though on account of its difficult solution, it is much slower than the preceding salts. It is, therefore, rarely given alone, but is employed in combination with other cathartics, the operation of which it greatly promotes. It is frequently united with Jalap, or Rhubarb, in small proportions, and a very useful and effectual cathartic is thus afforded.

Of the other Neutral Salts, as Bi Tartrate of Potash, Nitrate of Potash, &c., I shall speak under other heads, where they can be more properly introduced.

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#### MINERAL WATERS.

Having thus given a general description of the principle saline preparations in use, it is proper to consider several other saline combinations, which though not generally employed, still require some attention. These are Mineral Waters, a form of exhibiting purgative medicines, not only useful, but agreeable.

The first circumstance to be considered, is the small quantity of active ingredients contained in any given water. The smallness of the quantity of active ingredients is compensated by their number. Many of them, as sea water, and other mineral water,

containing three, four, or more different salts. The activity therefore experienced, is the result of a law formerly mentioned, that the combination of two or more substances of a similar nature, will produce a powerful effect, than an equivalent dose of any one.

The next circumstance to be considered, is, their extensive dilution. That extensive dilution is of essential service, is proved by the little activity of these articles, when taken in a small quantity of fluids, compared with the essential benefit they produce in the form of great dilution.

It is true, that the force of impression on any particular part is thereby lessened, and dilution may therefore be carried to excess—but the circumstance of extent of sentient surface, acted on at once, will probably in most cases, counter-balance this, and free dilution frequently promotes the general curative intention of mineral waters, as evinced in the very weak solution of a purging salt, which occurs in Cheltenham or other water.

The gaseous substances which are combined in a mineral water, are deserving of much consideration. The precise operation of these subtle agents, is not made known, but the effects of a gaseous water are more powerful, in proportion to the suddenness of the expulsion of the air, and therefore to the loosenss of its adhesion to the water, with which it is combined.

Of the variety of Mineral Waters, I shall only speak of the most important, and such as are generally employed.

Of those simply saline, the first is the Seidlitz Water. I shall in this enumeration, mention only those mineral waters remarkable for their saline impregnations, and of which imitations are made.

*Seidlitz Salt*, is the product of a spring found near Seidlitz, in Bohemia, a country abounding in mineral waters of various descriptions. The water was long neglected by the inhabitants, on account of its salt bitterness, until it was brought into notice by the celebrated Hoffman. The taste of the water is very saline, and bitter, but not in the least degree acidulous or brisk.

The particular analysis will not be interesting to you; it will be sufficient to state, that a pint contains the following proportion of active ingredients.

Carbonate of Lime, 944

Selenite, 5-140

Carbonate of Magnesia, 2-622

Chloride of Magnesium, 4-567

Sulphate Magnesia, 180-497--total, grs. 193-770, or 3 drachms, 13½ grains.—*Bergman*.

From this analysis it appears to be strongly impregnated with the Sulphate of Magnesia, and to this it owes its bitter, saline taste, and purgative property.

The identity of this salt, with that found in the Epsom spring, was ascertained by Hoffman, and as the Seidlitz water contains more of the active principle, the salt has been largely procured, by the usual processes of evaporation, and crystallization, and sold as the Seidlitz salt or powders. The effect which the water produces is in a high degree purgative, greater than might be supposed from the mere quantity of active matter.

A pint is generally a dose, and it has this advantage over the milder cathartics, that it operates without griping or any uneasiness.

This water is imitated artificially, but bears no relation to the native article. The Seidlitz draught is composed of two different powders. One contained in a white paper, consists of

Tartrate of Potash and Soda, or Rochelle Salt, zii.

Carbonate of Soda, ℥ii.

That in the blue paper of Tartaric acid, grains xxxv.

The contents of the white paper is dissolved in the fourth of a tumbler of spring water, and the blue paper in same quantity of sweetened water. They are united upon being taken, and swallowed during the effervescence.

*Sea Water.*—Is the strongest in saline matter of all the natural waters which are used medicinally, and indeed of all the waters we are acquainted with, certain brine springs and salt lakes excepted.

Sea water by analysis contains several distinct salts, which when reduced to English weights and measures, are in the following proportions.

An English pint contains as follows.

Chloride of Sodium, 241 grains.

Chloride of Magnesium, 65

Sulphate of Magnesia, —

Chloride of Calcium, 8

Iodine, —

Bromine, —

The foregoing results will vary in some degree, according to situation, that is whether obtained near the sea coast or not, in this latter situation it contains less salt.

Sea water seldom excites nausea, except to very irritable stomachs, or those to whom the taste is peculiarly unpalatable. In the quantity of a pint, it generally proves purgative, especially when the stomach has not long been used to this medicine, and it is a property which this water possesses, in common with the other bitter saline waters, that it may be persevered in for a considerable time, and a daily increased evacuation from the



bowels be produced, without debilitating the stomach and intestines, or impairing the digestive powers.

Sea water is not only used internally in various complaints, but also externally in the form of baths, particularly in scrofulous affections.

The powers of this remedy, in this disease, were brought into notice by Dr. Russel, and subsequent experience has confirmed the beneficial effects, which arise from its judicious use. When taken internally, it should be in such doses as will prove moderately purgative. A pint is generally sufficient, and this should be taken in the morning, at two doses, with an interval of half an hour between each.

It is often necessary to persevere a long time in the use of sea water, and it is a great recommendation that such perseverance is seldom productive of bad consequences to the general health. Dr. Russell mentions a case, in which a pint of this water has been taken daily for two hundred mornings, without any interruption, which produced a continued course of moderate purging, yet the appetite continued all this time perfectly good, and the health improved.

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*Cheltenham Water* is also saline, though it possesses chalybeate properties. A gallon contains the following principles.

Sulphate of Soda and Sulphate of Magnesia, grs. 480.

Chloride of Sodium, 5

Carbonate of Magnesia, 25

Chloride of Magnesium, —

Selenite, 45

Oxyd of Iron, 5—555 grs.

Carbonic acid gas, a large quantity.—*Fothergill.*

From this analysis, it would appear to be possessed of several valuable ingredients. It is decidedly saline, and the salts are for the most part of a purgative nature.

It is also a chalybeate, and if the analysis be correct, it is one of the strongest we are acquainted with. The iron is suspended entirely by the carbonic acid, of which gas the water contains about an eighth of its bulk.

Cheltenham water will not keep well, without being materially altered, for the chalybeate part is soon lost, by the precipitation of the Iron, which takes place, even in the closest vessels, after a few days. In order to obviate these effects, and to reduce some of the most valuable parts of this water to a more convenient form for carriage and keeping, the purgative salts are procured on the spot by evaporation, and by crystallizing the residuum, which is sold under the name of Cheltenham Salts. It is, in fact, little more than a mixture of Sulphate of Magnesia, and Sulphate

of Soda, and of this, the Cheltenham Salts, so common in the shops of our apothecaries, consists. A moderate dose operates effectually and speedily, as a cathartic, and in common with many others of the largely diluted saline waters, it acts in a very gentle manner, without occasioning griping.

A factitious compound is sold as a popular purgative under this name. It is formed by triturating together the following salts.

Sulphate of Soda, 120 grains.

Sulphate of Magnesia, 60

Chloride of Sodium, 10

Sulphate of Iron,  $\frac{1}{2}$

I do not know that as we receive the salts, whether they are capable of fulfilling any other than the above indications. Taken from the spring at Cheltenham, a small town in Gloucestershire, and from which this salt derives its name, it is endowed with more active powers, and is capable of being applied to a variety of cases. To persons labouring hepatic derangements from long residence in hot climates, and also in scorbutic affections of the skin, it is very efficacious.

In our country, the principal saline mineral waters are those of Saratoga and Balston, in the State of New-York. From an accurate analysis they consist of the following principles. In a quart of the Balston spring water there is found

Carbonic Acid Gas, 60 cubic inches

Chloride of Sodium, 43 grains

Chloride of Calcium, 4

Chloride of Magnesium, 2

Carbonate of Lime, 11

Carbonate of Magnesia, 9

Carbonate of Iron, 1

Congress water at Saratoga contains in the same quantity of water—

Carbonic Acid Gas 66 cubic inches

Chloride of Sodium, 103 grains

Iodide of Sodium,

Bi carbonate of Soda,

Carbonate of Lime, 27

Bi carbonate of Magnesia,

Carbonate of Iron,  $\frac{1}{2}$

Bromide of Potassium, (Steel)

Upon these ingredients it may be proper to make some remarks. The Carbonic Acid Gas is a very important one, that upon which it may be said the principal qualities of the water depend. All other ingredients which it contains, would be heavy and inert without the aid of this acid. Deprive the water of this principle,

and almost all its virtues disappear. It is this which holds the Iron and earths in solution, gives to the water its agreeable pungent, subacid taste, and excites that exhilaration of spirits, which almost all persons feel who drink the water.

The next useful article in the Chloride of Sodium, or common salt. It is most certainly from this salt combined with the water, in a very dilute state, that the purgative quality of these waters is derived. That a substance with which we are so familiar, and which is almost necessary to life, should be so powerful a purgative, as the Saratoga waters are known to be, would appear surprising. But combined as it is with other substances, its sensible and even physical properties are greatly altered and improved. In consequence of its combination with an excess of carbonic acid, daily evacuations to a considerable extent, may be produced, without debilitating the stomach or intestines, but on the contrary, the health, appetite, and spirits are improved.

Another important ingredient is the Iron, which though small in quantity, yet equals that of any other spring in Europe. The operation of this article upon the system is familiar to you.

From this cursory view, the observation of Dr. Cullen upon mineral waters will appear striking. They often, he says, produce cures, which we in vain attempt to perform by the combinations in our shops.

The other salts though small in proportion, and their uses not very well defined, are doubtless of utility.

From a review of what has been said, it is not surprising that before the analysis of these waters was effected, and their operation described, they were considered specifics prepared by the hand of nature against those formidable diseases to which mankind were liable. With the lights which Chemistry has lent us, we can explain their effects, so as to exclude any thing mysterious, though unfortunately, we cannot imitate them.

Diseases in which these waters are employed.—They are adapted to all those which proceed from a disordered state of the functions of the alimentary canal, or from obstructions of any of the viscera, particularly of the biliary organs, whether occasioned by irregularity in living, or the vicissitudes of climate and season.

*References—Saunders on Mineral Waters—Bell on do. do.—Periodicals.*

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#### ENEMATA.

Before concluding the subject of Cathartics, it may be proper to make a few remarks upon Enemata or Glysters. These, though humble means are sometimes employed as substitutes for purging, and have been found to serve some important purposes.



They are useful to evacuate the rectum, but principally to promote the operation of cathartic medicines, and in this respect their beneficial effects are best exhibited. When Enemata are employed as purgatives, it should be remembered that they cannot pass higher up than the valve of the colon, and consequently they can only act upon the large intestines. Therefore, they can seldom entirely supply the place of purgatives by the mouth, which pass through, and excite the whole intestinal canal—but they act as topical fomentations, and very often induce ease and sleep, when other methods fail.

Enemata are prepared in various ways. The most common Enema is as follows—

Castor Oil, ℥i.

Molasses, ℥i.

Warm water, 1 pint.

To this may be added ℥ss. to ℥i. of common salt, or a pint of soap suds, with ℥ss. of common salt; or an infusion of Senna with salt; or an ounce of Antimonial wine in water; or a solution of Tartarised Antimony, 8 or 10 grains to a pint of water. Any of these Enemata are sufficient for most purposes, and will either evacuate the rectum, or promote the operation of cathartic medicines.

The instruments commonly employed for this purpose, are a large bag or bladder and pipe, or pewter syringe. The former is very insufficient, and should never be resorted to, but from necessity. The syringe, when in order, answers for ordinary purposes very well. I present you with an instrument extremely well adapted for the ordinary purposes, and on other occasions, when we wish to overcome constipation by distending the bowels with fluids. It consists of a small cylinder capable of containing four ozs. of fluid, furnished with valves so arranged, as to admit of fluids being introduced through one and discharged through the other. It is, in short, when applied to the purpose I am describing, upon the principle of the forcing pump. Besides filling the bowels with any quantity of fluid, it has this great advantage, that it can be employed by the patient himself when seated on a bench, in which an opening has been made, or may be introduced under the bed-clothes, and thus any exposure prevented. The pipe is introduced into the rectum, and the end of the instrument placed in a basin of prepared fluid.

This instrument is also employed in evacuating the stomach of poisonous substances, and the gratifying results which have followed when laudanum or other substances have been taken, with a view to suicide, are such, that I may say, an instrument of this kind, should be in the possession of every physician.

When more powerful enemata are required, Tobacco, either in infusion or smoke, should be employed. The former is prepared by adding  $\mathfrak{z}\text{i}$ . of the leaves to a pint of warm water, and it is given in two portions. As distressing effects sometimes result from it, it is only to be resorted to in cases of emergency. I have witnessed an instance of the great depression produced by this substance, the patient being reduced to the last stage of exhaustion. To obviate these bad consequences, Mr. Earle has suggested that a suppository of Tobacco, or a segar, be introduced up the rectum, the symptoms as they become distressing, may be allayed by its removal. The smoke is a more safe application than the infusion. An apparatus has been invented for this purpose, but it is not always at hand, the following contrivance is a very good substitute. Take a common pipe, into the bowl of which tobacco is to be placed, and then covered over with a fold of linen or other substance—the tobacco is to be previously kindled, and the stem introduced into the rectum—a stream of air is directed upon the inflamed tobacco, which forces the smoke through the stem into the rectum.

It is singular, however, that cold, or even iced water, has been recommended by Dr. Rush to remove obstinate costiveness, and it is no less remarkable, that walking over a cold hearth bare-footed, or throwing water over the thighs and legs, has been productive of the same effect. This method has succeeded very frequently, and I have been informed by a respectable practitioner of this city, that being called in consultation in a case of obstructed bowels, the method alluded to had succeeded very satisfactorily. Very large doses of active medicines had been exhibited, and a great deal of castor oil without effect.

Such are the circumstances most worthy of attention, upon the subject of enemata, with a view to their cathartic operation.

They are employed, however, for other purposes. The rectum is remarkable for its sympathetic connexions, and with most of the viscera of the pelvis, this connexion exists in a great and powerful degree. When, therefore, irritation of any of these parts is to be allayed, or of the system generally, we can direct our remedies through this channel with great advantage. The enemata to be considered are of an anodyne nature. These instead of containing much fluid, seldom exceed a gill, and for this obvious reason, that they are designed to be retained. Two or three times the quantity of Laudanum is required when thus used, as when it is given by the mouth, and it is combined with a solution of starch, flax-seed tea, &c. Take 60 or 80 drops of Laudanum, and from  $\mathfrak{z}\text{ss}$ . to  $\mathfrak{z}\text{i}$ . of flax-seed tea, or solution of starch. This is to be employed and repeated as often as is necessary.

In irritable affections of the bladder or its neck—in the painful and spasmodic diseases of the uterus—and in the tenesmus of

dysentery, they are very valuable. In irritable conditions of the stomach when every thing taken into it is rejected, or when from peculiar idiosyncrasy, anodynes cannot be given by the mouth, they are productive of the happiest results, and in any of these cases their beneficial consequences at a proper period of the complaint, should be kept in recollection.

While upon this subject, I may mention a few other specific purposes, for which enemata have been employed. As vermifuges they have a peculiar and local use, when the worms are lodged in the lower intestines. particularly as very highly stimulating medicines are required to dislodge these troublesome animals, which if given by the mouth might produce a great deal of inconvenience and irritation. I shall speak more on this subject hereafter.

Tobacco infusion is given by way of glyster in strangulated hernia, to bring on that extreme degree of faintness and relaxation, which is most favorable to the reduction of the hernia.

The uterine or intestinal hæmmorrhage, astringent glysters, and particularly acid water, are sometimes of powerful use in checking these alarming accidents.

A solution of Assafoetida and other antispasmodics, are often resorted to in hysteria and other complaints. for which this class of remedies is employed. Nutritive enemata are sometimes had recourse to, when from obstructions in the Œsophagus, nourishment cannot be conveyed into the stomach. In a few days the capacity of the rectum is so much increased, that fluid nourishment to a considerable extent, can be given, and if we judge from the feces, which in these cases are of a good colour and consistence, digestion would appear to proceed regularly. But though life may be protracted by this means, yet we may be assured, that no application of food to the inner surface of the rectum can ever supply the absence of it in the stomach. For these vicarious actions of the system are always defective, whether arising spontaneously, or from the assistance of art.

In cases of sudden collapse of the system, following fevers or other cases where prompt remedies are required, and the powers of digestion fail, there is no part of the system to which stimulants may more effectually be applied than to the rectum. Under these circumstances enemata of turpentine, of brandy and water half and half, may be employed with the greatest advantage.

*Suppositories* are substances introduced into the rectum to procure stools. They are chiefly employed in relieving costiveness in infants, as well as adults. The best article is a piece of hard soap, cut into a cylindrical form, an inch or two in length, or a piece of paper may be rolled up into a point at one end, moisten-



ed with oil and introduced. These are commonly sufficient to produce an operation, by the irritation they excite in the rectum, and as they supply the place of medicine, deserve some consideration.

Suppositories are often formed of opium, or a pill of opium may often be employed in those diseases in which anodyne enemata have been recommended either for the purpose of acting upon the disease of the rectum, or of the neighboring organs. They will often be employed by patients, to whom the use of enemata is disagreeable, or when from the soreness of the rectum, introducing the pipe of a syringe would be very painful.

I have thus concluded whatever was necessary upon the subject of Cathartics. A class of medicines from which we derive more permanent benefit, by which we control the irregular determinations of disease, and can operate more extensively upon the deranged secretions, than with any other class of the *Materia Medica*. They are indeed powerful agents, and to know when to use them with vigour, and when to withhold them, is only the result of a perfect knowledge of the article and of the disease we are treating.



THE Third Division of the articles of the *Materia Medica*, comprehending that class of medicines which increase the natural operations of the intestines, without exciting irritation, having been considered with the second, I therefore proceed to the fourth.

#### DIVISION IV.

*Embraces those means by which we destroy, or counteract, offending substances lodged in the alimentary canal.*

#### ANTHELMINTICS.

By this term is meant such medicines as have the power of expelling, or destroying worms, situated in any part of the intestinal canal.

This includes an extensive variety of articles, which have been variously arranged, according to the peculiarity of their operation. Some of these medicines, act in the manner of a poison on those animals, others destroy them by a mechanical action, others by exerting a strong cathartic operation, and others, as chemical agents, in correcting that condition of the stomach and bowels, which appears to favor their generation and nourishment.

Each division has been made the foundation of an arrangement of this class; but as every kind of worm has its appropriate remedy, I prefer following the order of Dr. Chapman, in dividing them,

according to the worm they are best calculated to remove ; though it is still to be understood, that some of these articles are equally applicable to every sort of worm, and that they may be indiscriminately employed.

It is a fact, well known to physicians, that in the human body, there are found, occasionally, different species of worms. I shall treat of them as they differ in their habits, character and structure.

They are divided in two general divisions—the round and flat worm.

Under the first division are included,

1. The *Ascaris Lumbricoides*, or the long round worm.
2. *Ascaris Vermicularis*, or *Oxyuris Vermicularis*—the maw or thread worm.
3. The *Trichuris Vulgaris*, or the long thread worm.

Under the second division is considered,

The *Tænia*, or Tape worm. Of this worm there are two species,

1. The *Bothriocephalus Latus*.
2. The *Tænia Solium*.

The *Ascaris Lumbricoides*, is of a round form, in length from ten to twelve inches, and its circumference equal to that of a goose quill.

They infest the small intestines, but more frequently the course of the jejunum, and ilium. Sometimes they are known to ascend through the duodenum into the stomach, and they have been seen to creep out of the mouth and nostrils. It happens but rarely that they descend into the tract of the large intestines, and then, only after the exhibition of vermifuges, or from other causes which increase the peristaltic motion. They, in general, are found in considerable numbers. In one instance I have known from sixty to seventy being expelled in a few days, and have heard of two hundred in the course of a week.

Their colour is at first transparent, and they appear as if they have been sucking water mixed with blood—this colour soon disappears, and they become at length of a light and opaque yellow.

They are very feeble when they are voided, and soon die, in spite of all attempts to keep them alive.

This worm has been confounded by some with the common earth worm, the *Lumbricus Terrestris*.

The sexes of the *Lumbrici* are distinct, and they are oviparous, the ovula being discovered in the mucous surrounding them in the intestines.

All the intestinal worms are oviparous, and they produce a considerable number of eggs. If all these eggs came to maturity, the diseases from this source would be exceedingly numerous as well as dangerous. Fortunately, several occurrences take place,

calculated to prevent their developement. In short, it has been remarked by Rosin, that it is difficult for these animals to be abundantly produced.

This arises from the continual action of the intestinal canal, by which the eggs are carried downwards, and expelled with the excretions. In addition, the different gases, with the alimentary substances found in the intestinal canal, are often very unfavorable to them, and suffice frequently to prevent their developement, or to effect their destruction.

The uterus in this species of worm is very peculiar. It branches out into two large crura, which for the space of one or two inches, are continued of a uniform diameter. They then suddenly become diminished in size, and appear like opaque threads lying over, and embracing in a convoluted manner the intestinal tube in the middle. This convoluted apparatus is composed of very fine transparent membranes, which is distended with innumerable eggs.

It is these opaque threads which are visible through the transparent covering of the worm, and which, in common language, are considered as so many young worms.

The worm, of which we have been speaking, do not infest the human subject only. They are to be found in the hog, horse, dog, cat, and other domestic animals.

2. The *Ascaris Vermicularis*, *Ascarides*, maw, or thread worm, are on the contrary very small, being in thickness of the size of a piece of thread, and when full grown, about half an inch in length.

They are most commonly situated in the rectum, and when there, frequently pass out per anum.

They are also met with in the cœcum and colon, and have been found in the stomach, whence they have been called the maw worm.

In the rectum of children or adults, they are generally in considerable numbers, but when in other parts, their numbers are less considerable.

When discharged, they are extremely vivacious, and it is probably from this circumstance that the term *Ascarides* has been employed, from the Greek word *Askarizein*, Saltare, to leap. The male and female are here also distinct, and not as generally considered hermaphrodite.

3. The *Trichuris Vulgaris*, or *Trichocephalus dispar*, or long thread worm.

This worm is of rare occurrence, and it is only within the last half century, that any notice has been taken of it, or any accurate description drawn. Its body when full grown, equals in breadth the sixteenth of an inch, and in length nearly two inches. From



the head proceeds a kind of proboscis, which the worm protrudes or withdraws at pleasure.

The anterior part of the worm is small and capillary, forming two thirds of its length. It terminates in an acute point, where the mouth is situated. The posterior part swells out to a considerable size, and in the male is twisted round in a spiral form. In the posterior part is found the spermatic vessels convoluted, or folded back upon themselves, and which terminate at the extremity of the tail. In the male is a small transparent tube, or penis, and in the female is a kind of vagina.

These worms have been found in the intestinum rectum, in the inferior part of the ileum, also in the jejunum, mixed with their contents,

Of the flat worm, there is

1. The *Bothriocephalus Latus*—the Broad Tape worm.

It consists of a head, a chain of articulations more or less long, and a small round tail.

The head varies in size and shape from the *Tænia Solium*. It is oblong, and furnished with two, and sometimes four, oval fosses, or depressions, in the middle of which is the mouth, or opening into the alimentary canal.

The articulations in these species are broader than they are long.

It is found in the small intestines, of the inhabitants of Poland, Russia, Switzerland, and some parts of France, but it is not so generally met with as the *Tænia Solium*. It rarely exceeds in length fifteen to twenty feet, although they have been found longer.

The colour is generally of a dusky white.

Another distinction of this worm is, that it seldom parts with its joints spontaneously.

Three, four, and even more of these worms have been found in the same person, but they seem to be peculiar to the inhabitants of the countries just mentioned, and where they prevail, the *Tænia Solium* is not to be found, at least in the same subject.

2. *Tænia Solium*—Common Tape worm.

It has been called the solitary worm. From this circumstance, a conclusion has been drawn, which seems well established, that the smaller the worm, the more numerous they are found to be, and the larger the less numerous; hence the above term, bestowed upon this species.

This animal consists of a head placed at the smallest extremity, and a chain of articulations more or less broad or long, which gradually enlarge as they advance, and at length terminate in a tail formed by a rounded joint. Each of these joints contain their proper viscera, and they are very easily separated from each other while the animal is alive. Each joint, when detached,

has the power of retaining for a considerable time, its living principle, and is called, from its resemblance to the seed of the gourd, Vermis Cucurbitinus. The separated joints do not appear capable of retaining their situation for any length of time, but are soon forced down the intestinal tube, and at length creep out, or are expelled per anum.

It has been conceived that these Vermes Cucurbitinæ have the power of forming fresh joints, but this I do not consider probable—the head alone having this property. Their re-production too, would appear to be very rapid, were we to judge from the number expelled from persons subject to the tape worm. Certain it is, that when the whole is voided, except the head, in a short time after fresh joints are generated, and the patient is as much troubled with the worm as before.

The Tænia is always found in the jejunum and ileum, occupying the whole length.

The small intestines would seem to be the natural residence of this worm and the Lumbricus. Should their residence be made uncomfortable, they are readily removed from the system, either by vomiting, when they creep into the Stomach, or with the discharges of the bowels, when they pass the valve of the cæcum.

They are mostly of a pale white colour, and are of a very great length, varying from ten to thirty, and it is said one hundred feet.

The origin of worms is still buried in much obscurity, and it is probable that the speculations which may be formed upon this subject, will never remove all the difficulties towards a satisfactory explanation. All that we know certainly, is, that whenever a nidus is formed favorable to their production and growth, there we see them generated and supported.

Climate seems to have a considerable influence in the development of worms. They are more frequent, all other things being equal, in moist and cold, or moist and hot countries, than under other circumstances.

Ascarides are very common in Holland. In certain parts of Switzerland, the Tape worm is of very frequent occurrence—women being more affected than men. To the moisture and heat which prevails about Grand Cairo, in Egypt, during the season of the inundation of the Nile, are we to attribute the frequency of this species of worm in that country.

Season also influences their production. Thus they are observed by all physicians to be more common in summer and in the autumn, than at any other period, especially in those countries where fruit and pulse are eat, and when the influence of this vegetable diet is not corrected by the use of fermented drinks.

That particular states of the alimentary canal give rise to them we are convinced of, from this fact, that the species mentioned belong exclusively to the human system, and that when carried out of it they speedily die. They are found in robust, and in feeble habits; in children as well as adults, and in all climates; so that we are at a loss to determine the particular condition of the intestines which favours their production.

They are most commonly found in children with weak digestive organs, and feeble constitutions, a state of body favorable to the production of mucous, which has been thought to serve as a nidus for their further developement and support. Hence it is that poverty in diet, and one consisting of crude vegetables, and unripe fruit, has been observed favorable to the production of worms, and hence they always abound in the low and poorer classes of society.

It has been long a disputed question, whether worms were harmless to the system, or whether they were in themselves a primary, or accessory cause of disease.

When we consider how universally worms are found in all young animals, and how frequently they exist in the human body, without their presence being suspected, we should be disposed to conclude, that they perform some essential and necessary offices in the animal economy. When we find them existing in the robust and healthy, without any interruption to the functions of life, we may venture on the assertion, that in a certain degree they are harmless. When too, we consider the infinite order and mutual subservience of every part of the natural chain of animated creation, and their adaptation to some useful purpose, we should be disposed to say that nothing was created in vain.

It is only, I believe, when their number is increased to such a degree as to disturb the regular operations of the system, i. e. producing such a degree of irritation that the natural sympathies are awakened, or probably from a misplaced situation of the worm itself, that disease is produced. Under these circumstances, the diseases will be found as numerous and diversified as the sympathies of the intestinal canal with the various parts of the body.

The whole train of nervous and convulsive diseases are excited by this cause, as chorea, epilepsy, convulsions, hydrocephalus, paralysis, and a variety of other nervous and convulsive affections. Besides these they have been said to produce pleuritic and rheumatic pains, dysentery, remitting fever, chronic and spasmodic cough, cynanche trachealis, &c.

Thus is exhibited a striking instance of the influence of one exciting cause, in bringing into action a variety of diseases, according to the predisposition of the patient. This, you observe,



varies in different individuals, hence such a diversity in their diseases appears. In every individual, therefore, there are particular weak parts, which are less liable to resist disease than others, and hence upon any irritations being excited, the disease appears with most violence in such part. It rarely, therefore, happens in fever, that there is simple excitement alone, but most commonly pain in some particular organ is felt. This pain is only a proof that such organ is less liable to resist the increased excitement than another. The same may be said in these cases. The irritation excited by the worm, brings into action the particular form of disease to which the system is pre-disposed. If they are capable of producing the various disturbances in the system, I have mentioned, they are capable of producing a fever. several cases of which I have seen in practice. I would caution the younger part of my hearers, that these cases are of less frequent occurrence than is commonly supposed, and that great mischief is sometimes done by treating the disorders of children as worm cases which really are not so. Popular prejudice is too apt to attribute to the existence of worms the diseases of children.

Dr. Hunter, we are told, dissected a number of children, who had been supposed to die of worm fevers, and whose complaints were of course treated as proceeding from worms, in whom, however, there appeared on dissection, to be not only no worms, but evident proofs of the disorder's being of a different nature.

This caution is of the more importance, when it is considered, that the symptoms commonly attributed to worms alone, may be produced by a foulness of the bowels. Hence I would introduce a practical remark which is of consequence, that in the treatment of such cases, practitioners should not rest satisfied in administering to their patients such medicines as are possessed only of an Anthelmintic quality, but to join them with those which are particularly adapted for cleansing the primæ viæ, as it is uncertain whether a foulness of the bowels may not be the cause of all the complaints.

By pursuing this plan, we obviate the dangers which may arise, from accumulations of acrid matter being retained in the bowels, at the same time, by combining a medicine of an Anthelmintic quality, we effect the expulsion of the worms should they really exist.

That worms, however, produce fever I have already stated, and as it is not of very frequent occurrence, its symptoms may be mentioned in this place.

It has no regular symptoms by which it is distinguished.

It generally assumes a remittent character, the excitement never running very high—the faculties of the patient are not often much disturbed, but there sometimes exist considerable heaviness or drowsiness, often the reserve, with great fretfulness, the child being satisfied in no other situation than in the arms, and moving about. Occasionally there attends twitching of the muscles, or starting in the sleep, with a grinding of the teeth. Pain we would suppose, exists particularly in the abdomen, from the cries of the child. One circumstance, alone, often leads me to suspect the origin of the fever, which is, its not being much affected by the depleting remedies employed in such cases; and notwithstanding their operation is carried to a proper extent, the symptoms continuing with a steadiness and obstinacy which would lead one to suspect some more dangerous affection. If, at this period, Anthelmintic medicines are employed, and under these circumstances, the *Spigelia Marilandica* is one of the best, not only from its anthelmintic properties, but its febrifuge, every symptom which had been previously so obstinate, will subside in the course of twelve hours, with the discharge of worms.

I have seen the same effect take place from four, twelve, twenty and sixty being expelled from the body. This effect I have so often witnessed, that I have no hesitation in asserting it. From this statement, it is obvious that the symptoms are not produced by their numbers alone. They will be equally produced by a change of situation in the worm, the irritation of which is often alone sufficient.

The *Lumbricoides*, for it is to these I allude particularly, being generated and inhabiting particular tracts of the intestinal canal, these parts, we may venture to suppose, are less affected by the irritation their presence produces than others.

When, from any cause a change of situation occurs, and they remove from their accustomed abodes, disease is often excited, and this, I have observed, is as considerable from the presence of a few, as from many.

The peculiar symptoms Dr. Chapman has described, as attending upon a worm fever, I have never seen in a single instance.

I conclude my general description of worms, and will proceed to speak of the articles adapted to their expulsion. The arrangement I shall pursue, will be, to consider under one head the articles best adapted to a particular species of worm, as this appears to be the clearest order, I can adopt, recollecting, only, that some of the articles may be employed indiscriminately in all the different species.

Before proceeding to their consideration, it may be proper to point out the symptoms by which the presence of the *Lumbricus* may be indicated.

These may all in a greater or less degree, be referred to intestinal irritation, and the symptoms which usually occur, are, pains in the abdomen, itching in the nose, nausea, vomiting, looseness of the bowels, slender intermitting pulse, epileptic convulsions. To these are added a pale and occasionally a flushed countenance—the eyes are dull and heavy, the pupils dilated or much contracted, there is tumefaction of the upper lip, and eyelids, the breath is fetid, the sleep is disturbed, during which the patient grinds his teeth, or starts suddenly as if frightened. The appetite is variable, being sometimes suppressed, and at others exceeding voracious, the abdomen is much tumified and hard.

The above are the most common symptoms usually met with. It is not to be understood that they all occur in the same case, but some of them will generally be present.\* They may, however, all be absent, and nothing will lead to a knowledge of the existence of worms but their actual discharge,

References—*Brera on Worms. Memoirs London Medical Society. Bremser Traite des vers Intestinaux.*

#### PARTICULAR ANTHELMINTICS,

*And the articles adapted to the expulsion of the Ascaris Lumbricoides.*

*Family Gentianeæ—Spigelia Marilandica* or *Pink Root*, is a native plant, and is to be found in all the southern parts of the United States.

Stem, herbaceous, six to twenty inches high.

Leaves, sessile, ovate, lanceolate, acute.

Flowers is a simple secund raceme, yellow within, crimson without.

The roots are perennial, with many fibrous branches, of a yellowish colour when first dug out of the earth, but becoming black when dried.

Every part of the plant may be employed as a vermifuge, but the root is unquestionably the most active. For its efficacy as an Anthelmintic, it has long been celebrated, and was first recommended in the Edinburgh Physical and Literary Essays, by the late Dr. Garden, of this city.

The reputation which it had acquired it well sustains, and most practitioners will agree in the decidedly beneficial effects, resulting from its employment in this species of worm. It is, without doubt, a poisonous and narcotic vegetable, and it is probably by virtue of this poisonous quality, that it proves so beneficial in worm cases.

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\* In one case which fell under my observation, no other symptom was present but a constant pain in the abdomen, and upon employing Anthelmintic medicines, twenty-five worms were discharged.



It has been said to operate most favorably when it purges, and its good effects have been ascribed to this quality, but from long experience with the *Spigelia*, I am safe in saying that it seldom or ever purges, and that it is necessary to follow its employment with cathartic medicine. Its effects would appear to be of an intoxicating and debilitating character upon the worm, in consequence of which, by the peristaltic motion of the bowels being quickened, they are readily carried through the tract of the intestines, and finally expelled.

The *Spigelia* has been objected to, from its supposed tendency to produce drowsiness, violent pain in the forehead, and temporary loss of sight, with tremors, convulsions, and death. These objections appear to have been transmitted from one writer and practitioner to another, without a proper consideration of the subject.

Thus, Dr. Chalmers in his *History of the Climate and Diseases of South-Carolina*, page 76, says, that of all the vermifuges he is acquainted with, Indian Pink is decidedly the best, but it must be properly guarded to prevent drowsiness, violent pain of the forehead and eyes, and a temporary loss of sight, which often ensue from it; nay, it affects the nervous system to such a degree, that convulsions supervene, as happened to two lusty children in one family, of seven and five years of age, owing to the too free use of this plant, before its properties were well known to us.

To this catalogue of the dangerous and deleterious effects of this medicine, I can only add, that after an extensive use of it, in every variety of constitution, and at every period of life, I have never known these effects to occur\* in the degree described.\*

In confirmation, I may add, that Mr. Home, who performed a number of experiments with it, says, that in none, not even in those cases where the bowels were confined, did it produce vertigo, dimness of sight, or convulsions, as we have been told, nor did it excite any of the effects of the narcotic poisons. I would not wish to be understood as asserting that these effects never take place, the fact has been stated by several very respectable writers, and we are to consider the occurrence as taking place, though, I believe, it is more rare than is commonly supposed.

We have the authority of the late Dr. McBride, that its narcotic effects are seldom or never attended with danger, and that some physicians consider them an evidence of the favorable operation of the medicine.

The symptoms commonly subside in the course of about twenty-four hours, leaving the patient as well as before taking the Pink Root.

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\* Except in one case where an exceedingly strong infusion had been given.

It has been said, that the deleterious effects observed in the employment of the *Spigelia*, do not depend upon the root itself, but upon a small vine which entwines itself about the plant, and to which all its bad effects are to be attributed. The opinion, however, is wholly without foundation.

The *Spigelia Marilandica* is used as an anthelmintic in powder or infusion. Of the powder, from five to ten grains may be given to a child two years old; and to an adult ʒss. to ʒii. combined with calomel, or any other purgative, and thus combined, its narcotic effects are never observed.

I prefer, however, the infusion.\*

In this form, it is much more efficacious, and it is proper to pursue the administration of the infusion for thirty-six hours or two days, when a cathartic should be given, either mercurial or castor oil. Given in this form it rarely fails to bring away worms, if there are any present, and the success which has followed its use, has long satisfied me that it is one of the most valuable anthelmintics we possess.

The *Spigelia Marilandica* enters into the composition of several quack medicines. The most celebrated is Leman's, which is a compound of *Spigelia* and *Senna*, with a little of the leaves of *Savin*, perhaps only to disguise it.

This compound is very efficacious, and is said to produce none of the nervous effects that have been mentioned of the *Spigelia Marilandica*.

Besides its anthelmintic property, the *Spigelia* is well adapted to some of the febrile diseases of children, unaccompanied by worms, especially in the insidious remittent, which so frequently lays the foundation of dropsy in the brain. Here it seems to exercise an excellent febrifuge property, and its employment will afford satisfactory results.

Dr. Chapman is satisfied that every practitioner who has largely used the medicine must have seen it do good in the febrile affections of children, though no worms are brought away.

The *Spigelia* loses its activity by being kept, and should not be employed after it has been gathered longer than a twelve-month.†

References.—*Thompson's Inaugural Dissertation*, 1802. *Essays and Observations, Physical and Literary*, Vol. i. page 386.

\* The infusion is prepared by pouring a pint and a gill of boiling water upon two drachms of the roots, and simmering down to a pint. This is sweetened with molasses, and may be given in doses of a wine-glassful in the twenty-four hours. Thus prepared, it is more readily taken by children, than the powder, which being light and very bulky, is with difficulty swallowed.

† If you prefer giving the powder, I would advise you to prepare it yourselves. That which is met with in the shops is very old, and prepared from the plant after the roots, which are fine and delicate, have been broken off, and the article from not being saleable, is pulverized.

*Family Melioceæ—Melia Azedarach—Pride of India—Poison berry tree.*—This tree, which has become naturalized in the States, of Carolina and Georgia, was originally introduced from the Island of Japan in the East Indies. By whom it was brought into this country I have been unable to learn, but that it is well adapted to our climate, its luxuriant growth and the universality of it, abundantly testify. It has for some time been in repute, for its medicinal virtues. Among these are the strong anthelmintic powers which it possesses, in the expulsion and destruction of the *Ascaris Lumbricoides*. Of its efficacy in this respect, the late Dr. Barton spoke in very high terms, and considered it so valuable an anthelmintic, that it deserved to be introduced into general practice. Dr. L. Kollock, of Georgia, also speaks of it in similar terms, and considers it a vermifuge of great efficacy. Of this article I can say but little from my own experience, being so well convinced of the virtues of the *Spigelia*, that I have seldom resorted to any other. It is, however, very much employed by the planters of our State, and their opinions of its utility fully corroborate the above statements—they even declare that it has exhibited good effects after the *Spigelia* has failed. The root, or what is better, the bark of the root is employed, and is best exhibited in the form of decoction.

The following are the directions for preparing it.

The outer covering of the root is to be scraped off, and about four ounces of the bark of the fresh root, is boiled in a quart of water until it acquires the colour of strong coffee, or until it is reduced to a pint. Of this half an ounce or an ounce may be given every two or three hours, until it operates, which it does both by vomiting and purging. Where this effect is not intended, it is commonly given in the quantity of a tea-cupful for several evenings, and a cathartic is then exhibited. The cases to which it is best adapted are those of the common round worm, or *Lumbricus intestinalis*. Whether it is equally efficacious against the *Tænia* or tape worm, I am not sufficiently informed. It has been said to be also useful in this species.

This article, like the *Spigelia*, is a good febrifuge medicine, in those affections usually denominated verminous fevers, but where no worms are voided.

Michaux, the celebrated French botanist, states, that the pulp which invests the stone of the fruit, when pounded with tallow, proves a good application in cases of *Tinea capitis* in children.

The following interesting facts respecting the use of the berries of the Pride of India, proving their utility as an Anthelmintic, were communicated to me by a friend. Two negro girls were placed under his care, in a very feeble state of health, so much so that they were not thought likely to live. To general emacia-



tion was added tumid and enlarged abdomen of a considerable size—skin hard, unsperspiring, and the whole appearance unhealthy. Worms were suspected, and from the strong anthelmintic properties of all parts of the tree, it was supposed that the berries would be endued with similar powers, while their own use would be more agreeable and convenient. Accordingly they were collected when ripe and juicy, and the girls were directed to eat a gill of the berries before breakfast, rejecting the stones. They were directed to increase the quantity to a pint or more during the day. The taste of the fruit is a bitter sweet, not disagreeable, but which improves so much upon the palate that after a while they become agreeable.

This course was continued a fortnight or three weeks, when my friend was informed by one of the girls that a substance was discharged from her to which she called his attention. Upon inspection it proved to be the *Tænia* or tape worm. The plan was continued, and soon eighteen feet more were discharged, and soon another portion, about seven feet in length. Other portions of a few feet, and a foot until it was presumed the whole had been removed. The health improved, the tumid abdomen subsided, and the patient restored to health.

The other girl discharged a large number of *Lumbrici*, and recovered.

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*Family Chenopodææ—Chenopodium Anthelminticum—Jerusalem Oak*,—Characters—Leaves, oblong, lanceolate, sinuate, dentate, racemes naked.

Root, perennial.

Stem, herbaceous, erect, furrowed, branching, four to six feet high.

Leaves alternate, nearly sessile, glabrous, strongly veined.

Flowers in axillary, leafless spikes, which towards the summit of the branches become densely crowded.

This plant is a native of Buenos Ayres, but grows in various parts of the United States, and in the neighbourhood of this city. It is said to be an anthelmintic, and this property resides in every part of the plant, but the seeds are the most powerful. It is employed in several ways. Either the juice is expressed from the leaves and given in the dose of a table-spoonful morning and evening, upon an empty stomach, or more commonly the seeds are powdered, and a table-spoonful is given, enveloped in honey or mucilage. The dose to be repeated for several successive days.

From the seeds, however, there has lately been extracted an oil, which has been much recommended in cases of worms. It

said by Eberle to be an exceedingly active vermifuge, and that he has succeeded in many cases in expelling numbers of *Lumbrici* with it, after anthelmintics had been tried in vain. The oil is the preferable form for its exhibition, and after being employed for several days it is to be suspended, and a cathartic administered. If worms are not discharged, recourse must be had to the oil again.

The dose for a child under two years, is five drops, mixed with a good deal of sugar or mucilage, and from two to five years, from five to ten or fifteen drops; for an adult, from twenty to thirty drops.

The principal objection to this article is its extremely unpleasant odour and taste, which are so tenacious as to remain for several hours. Could it be dispossessed of these qualities, it might be introduced into more general practice.

*Family Leguminosæ—Geoffræa Inermis—Cabbage tree bark.*—This tree, of which the bark is used as a vermifuge, is a native of Jamaica and the other West India Islands. It has lately been introduced in the *Materia Medica*, and is spoken of by the physicians of the West Indies as an anthelmintic of great power and efficacy, but is little employed by the physicians of this country.

*Dolichos Pruriens—Cowhage.*—The *Dolichos* is a climbing plant, growing in great abundance in warm countries, particularly in the West Indies. It has pods, thickly beset on the outside with stiff hair, which, when applied to the skin, occasion a most intolerable itching.

This medicine has been much used in the treatment of worms, the part employed being the hairy spiculæ, scraped from the pods and mixed with the syrup. They are supposed to act mechanically upon the worms, but occasion little irritation to the surface of the *primæ viæ*, as it is protected by a mucous covering.

Mr. Bancroft, in his natural history of Guiana, in South America, gives an interesting account of this article. After speaking of the frequency of disease from worms in that country, and the insufficiency of the usual remedies for their destruction, he states, that the planters have recourse to the Cowhage for that purpose. From whence its use was suggested is uncertain, but its efficacy is indisputable. The part used is the hairy substance growing on the outside of the pod, which is scraped off, and mixed with common syrup to the consistence of a thin electuary, of which a tea-spoonful to a child of two or three years old, and double the quantity to an adult, is given in the morning,

fasting, and repeated the two succeeding mornings—after which a dose of Rhubarb is subjoined.

The patient, it is added, after the second dose usually discharged an incredible number of worms, so that the stools consisted of little else than these animals. But though there are sufficient proofs of its efficacy, some doubts have been entertained of its safety. For consisting of a number of spiculæ, exquisitely fine, and so acutely pointed that when applied to the skin they excite an intolerable itching, and even inflammation, it might be apprehended that dangerous consequences would arise from their contact with the coats of the stomach and bowels.

From the experience of those who have employed it extensively in practice, it would appear that these objections are entirely theoretical, and that it may be given with perfect safety. That its good effects are derived from its mechanical operation, is proved by this circumstance, that Cowhage has been given in tincture and decoction, to worm patients, without any sensible advantage.

The dose of the Cowhage mixed with syrup, to the consistence of an electuary, is a tea-spoonful to a child, and a table-spoonful to an adult. repeated in the morning for several successive days.

The worms are said to appear with the second or third dose, but the operation of the medicine is to be promoted with a purgative dose.

This remedy is particularly designed to destroy the long round worm, the species of which I am treating.

The *dolichos* is a vermifuge interesting from its character, but which is seldom or never resorted to in this country.

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*Camphora*.—Of all the remedies for *Lumbricoides*, Professor Brera thinks there is none equal to camphor. The anthelmintic powers of camphor were known some time since, and its efficacy has been again recently noticed. By the Italian physicians, it is generally preferred to other vermifuges.

Half a drachm is given in the form of mixture rubbed up with mucilage of gum arabic, and this is administered in doses of a table-spoonful frequently repeated.

The employment of camphor is also attended with this advantage, that it counteracts the predisposition to the further development of verminous ova.

I have always used it, says Professor B. with the greatest success, and cannot too strongly recommend its use to physicians in worm complaints, whether given in the mode already mentioned, or some other, combined with other remedies.



Besides these articles, there are various medicines which having a purgative operation, have been employed for the expulsion of worms. The *Ascaris Lumbricoides* not being very tenacious of life, is easily destroyed and evacuated by their use. The purgatives which have been most commonly employed, are, calomel alone, or combined with jalap, helleborus fœtidus, scammony, aloes, chloride of sodium, &c.

Calomel, as a vermifuge, has long been held in repute, and its powers, in this respect, have been the subject of eulogy by most physicians. It has even been said that the crude metal boiled in water, and the water drunk, has been effectual in these cases. But the water, it is evident, can receive little impregnation from the mercury, and if it has any effect, it must be from foreign or accidental impregnation.

Calomel, however, is a very useful anthelmintic, but to be efficacious it must be given in a large dose at night, and worked off the next morning with castor oil, or some other cathartic. Or it should be repeated at short intervals, in order to remove such worms and ova, as have been screened from the preceding dose, by the folds of the intestines, or in mucous.

A cathartic should be exhibited to remove it from the system, so as to prevent salivation. Combined with jalap it often brings away worms when given for other purposes, and it is a very common ingredient in all the nostrums advertised for the cure of worms. It is also a very useful auxiliary to the more decided vermifuge medicines.

Fifteen grs. of Jalap, the same quantity of Rhubarb, and five grs. of Calomel, will generally expel Lumbrici, when given for three or four mornings in succession.

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*Helleborus Fœtidus*—Is a native of this country as well as Europe. It grows in swamps and meadows, has a very offensive smell and an acrid taste. It operates powerfully as an emetic and cathartic. In doses of five or ten grains, to an adult, of the powdered leaves every night for several in succession, it operates as a powerful anthelmintic, and for this purpose it has been recommended by several European practitioners. It should not, however, be employed till safer anthelmintics have been tried in vain, for the imprudent administration of it has been attended with fatal consequences.

This very active article is still retained in the *Materia Medica* as an anthelmintic, but no one at the present day thinks of using it.

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The next article I shall speak of under this head, is the Chloride of Sodium, or common salt. The practice of using this article is

very ancient, and common in some countries. In Ireland it is the custom to feed children, who are afflicted with worms, for a week or two upon the salt sea weed, and when the bowels are well charged with it, to give a purgative dose, in order to carry off the worms after they have been debilitated by the salt diet.

In his own practice, Dr. Rush says that he has administered many pounds of common salt, colored with cochineal, with great success in destroying worms.

Dr. R's. formula, was the following.

R. Chloride of Sodium,  $\mathfrak{z}\text{ii}$ .

Cochineal,  $\mathfrak{z}\text{ii}$ . m. ft. Pulvis,

Of this  $\mathfrak{ss}$ . to  $\mathfrak{z}\text{i}$ . was given in the morning on an empty stomach.

The value of Salt as an anthelmintic, may be inferred from the practice in some countries, of compelling criminals condemned to death, to live upon a diet without salt. Multitudes of worms being thus produced, from which death was ultimately the consequence.

The ancient laws of Holland ordained as a punishment to criminals, that they be kept on bread unmixed with salt, as the severest which could be inflicted. The effect was horrible, the criminals being devoured by worms engendered in their stomachs. Mr. Marshall has related the case of a lady who had a natural antipathy to salt, and was, in consequence, infested with worms during the whole of her life.

Its importance to animals generally, is evinced by the long journeys they have been known to take to reach what has been called the salt licks.

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Before completing my description of the remedies adapted to the *Ascaris Lumbricoides*, it may be proper to say a few words upon an article of which much has been said within a few years, I mean the *Cedar Apple*.

A paragraph appeared in our newspapers some time ago, setting forth in extravagant terms the efficacy of this substance. The paragraph stated, that some children, on a visit to a friend in one of the Northern states, took from the limbs or twigs of the cedar tree, what is generally called the cedar apple or knot. One of them who had always been afflicted with worms from the age of two years, and for whose relief every thing had been tried in the power of a skilful physician, but to no effect, and was then in a delicate state of health, eat several of the apples. The consequence was that several worms were expelled from her. The remedy was again administered, and in the course of twelve hours, three hundred and upwards came from her. The father of the girl, to be satisfied of its efficacy, gave the apples to five of his children, who were in ill health. It had the same effect of expell-

ing worms from them. He also eat several himself, and the effect was the same. Thus, it is added, through the medium of mere chance, perhaps one of the best remedies, and the most simple, has been discovered.

The apples were recommended to be eaten nine mornings in succession, fasting. Or if dry, to be pounded fine, and taken in molasses, or eat just as they come from the tree.

The apples are not to be confounded with the seeds. They are an excrescence from the *Juniperus Virginiana* or Red Cedar, and are produced by the puncture of an insect of the bark or young branches. The sap exudes and forms the substance in question. It is formed, in short, in the same manner as the gall nut. Its sensible properties are considerable astringency and bitterness.

An article, the virtues of which were set forth in such extravagant terms, would not be allowed to remain unemployed for any length of time. Considerable eagerness was therefore manifested to experiment with it, and many cases, in which worms were suspected, were submitted to its operation. I am not sufficiently informed of the result in these cases, to speak positively of its powers. In two cases in which I employed it, considerable irritation of the stomach was produced, and the remedy was discontinued. In another, in which it was tried by a physician of this city, it did not produce the desired effect.

Dr. Brocchus, a writer in the *Philadelphia Journal*, instituted experiments with reference particularly to its vermifuge powers. It was employed by him in six different cases, and the result was sufficient to satisfy him that the article possessed considerable activity as a remedial agent, but that, upon the whole, it was not superior to many others, which are employed with the same intention,

The *modus operandi* seems to be by virtue of the bitter principle which it contains, proving a poison to the worms, and also by its tonic powers, overcoming that condition of the alimentary canal, upon which their generation is supposed to depend.

The dose in which it is given is from ten to twenty grains, two or three times a day, and thus pursued for a week.

During the administration of the powder, a decoction of the apples made very strong, may be given, in doses of a tea-cupful several times a day.

The quantity directed by the person who introduced the apple to our notice, was one for every year of the person's age, as they are taken from the tree, and this generally continued for nine mornings in succession, fasting. Thus taken, however, the quantity would be very variable; depending upon the size of the apples, varying as they do from the size of a pea, to that of a small nut. The medium dose would be such as I have stated.



A more agreeable mode of exhibition, and one which I have been informed has proved effectual, is in the form of tincture, of which  $\zeta$ ss may be administered several times a day, and thus employed, or in the form of decoction, its irritation upon the stomach, would be less felt.

It may be an article worthy of further investigation, and would afford a good subject for an inaugural dissertation.

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Having completed the consideration of the remedies which are employed in the treatment of the long round worm, I will proceed to those of another species of this class, the *Ascaris Vermicularis* or *Ascarides*.

Previous to entering upon them, I shall consider the symptoms, seat, and other circumstances connected with their presence.

The *Ascarides* are about half an inch in length, and their usual seat is the rectum. The symptoms they produce are an uneasiness in the part, and an almost intolerable itching in the anus, which sensations usually come on in the evening, and prevent sleep for several hours.

They are attended with heat, sometimes so considerable, as to occasion a swelling in the rectum, both internally and externally, and if these symptoms are not relieved a tenesmus is brought on, with a mucous dejection. Sometimes there is a griping pain in the lower part of the abdomen a little above the os pubis. In addition to these symptoms, they are very often found in the bed-clothes, or discharged with the alvine evacuations.

The general health of the patient is not much impaired, from the long continuance of the disease, and this kind of worm, though as difficult to be cured as any, yet is the least dangerous of all. They have been known to accompany a person through a long life, without any reason to suspect they had hastened its conclusion. They are difficult of cure, in consequence of their tenacity of life, and by burying themselves in the mucous of the first passages, they resist in a great degree, the action of medicines. Hence some peculiarity in their treatment.

One of the difficulties which I have mentioned in the treatment of these worms, depends upon their becoming imbedded in the mucus of the bowels, by which they resist the action of medicinal agents. It is this which preserves them unhurt, though surrounded with many other liquors, the immediate touch of which would be fatal. Purgative medicines by lessening this slime, never fail to relieve the patient: and it is not unlikely, that the worms which are not forced away by this quickened motion of the intestines, may, for want of a proper quantity of it, languish and at length die.

Of the kind of purgatives best adapted to this purpose, great difference of opinion exists, some recommending the brisker, and others the more mild cathartics. It seems, however, that those purgatives are the best, which while they operate with sufficient activity, do not enfeeble the patient to such a degree, but that a repetition can be easily borne.

Those mineral springs which contain much saline matter, are of this sort.

Jalap mixed with sugar, in small doses, is efficacious in children, as it can be repeated daily.

Cinnabar and Rhubarb, in the quantity of half a drachm each is very useful, as it never fails to bring away a mucous as transparent as the white of an egg, and in this many *Ascarides* will be found.

Calomel too, has been spoken of with much confidence of success, but I believe with little more benefit, than any other purgative which operates briskly would have done.

Aloes, and its preparations, have been much prescribed, from their known tendency to act upon the lower portion of the intestinal canal, in which these animals reside. In the ordinary dose it is sometimes very effectual, but the *Hiera Picra*, which consists of Aloes and *Canella Alba*, is a more powerful remedy. It is a very popular remedy, and has often succeeded when other means have failed. In the ordinary method of prescribing it, an ounce of the powder is dissolved in a pint of ardent spirits, of which sufficiently digested, a table-spoonful diluted may be given to a child four years old, and repeated until it operates. Or the *Elixir Proprietatis*, or Compound Tincture of Aloes, in doses of  $\text{ʒii.}$  to  $\text{ʒss.}$  repeated two or three times a day, or night and morning.

With purgatives, however, other means are required. These are *Enemata* or *Glysters*.

They become necessary from the tenacity of life which these worms exhibit, and from their being seated far from the stomach medicines administered by the mouth, have little other effect upon them, than as they evacuate the contents of the rectum in common with the other viscera; but administered in this way, the relief afforded is very considerable, though not in all cases certain.

The injections most approved, are those of,

Aloes,  $\text{ʒi.}$  to  $\text{ʒii.}$  dissolved in a pint of new milk, and injected twice a day.

A weak infusion of Tobacco—a solution of *Assafœtida*—Lime water—Olive oil—Camphor.

The injection of Camphor, which I believe to be the best, is prepared in the following manner.

*R.* Camphor.  $\text{ʒi.}$ , Olive oil,  $\text{ʒii. m.}$  for an enema.

It is to be administered at bed-time, every third night, at three different periods, or it may be repeated on alternate nights.

This has been found a more efficacious remedy against the violent itching, and other painful symptoms of the anus occasioned by these worms, than most of the rest. It generally gives some immediate ease, and stays all night without inconvenience. In the morning it comes away with a natural stool, or without, and with it many dead worms are removed.

Solutions of salt, either tepid milk well salted, or a table-spoonful of salt dissolved in half a pint of water, are very efficacious, and the late Dr. Kuhn of Philadelphia observed, that he hardly ever knew it fail.

The Spirits of Turpentine enveloped in mucilage, or the yolk of an egg is also valuable.

With these injections the rectum should be filled, but the quantity thrown up should never be so great as to produce great distension of its cavity, lest the coats of the bowels being stimulated should hastily contract and expel the glyster, which acts with more certainty if it remains a short time. The operation, repeated for a few successive days, will seldom fail to remove for a time the *Ascarides*, and the symptoms they produce. It will be proper too, after the use of the injections, to administer a cathartic, by which the enfeebled worms will be brought away, and in the majority of cases this plan of treatment will succeed.

The following case, detailing the symptoms connected with the *Ascarides*, and the treatment pursued, will be read with some interest.

I cheerfully comply with your request that I would communicate what I know of a very troublesome affection, to which I have been subject during the greater part of my life, (I am forty-two years of age,) and of which I have only recently been relieved.

I have been troubled with the small intestinal worm called *Ascarides*, from my earliest childhood. As far as I can now recollect, from two to three dozen passed from me, on an average, per day, during my boyhood—the number, however, varied considerably.

I recollect that when I was in any way costive, the number of worms that passed from me was not as great as under other circumstances. At all times the eating of fruit, particularly apples, increased the number discharged, and by bringing them into the rectum, always rendered the symptoms more distressing. A couple of hours after partaking of this fruit, I was sure to be incommoded with *Ascarides* for a day or two.



In my early life, the eating of cheese produced the same effect. This has not been so much the case with me for the last twenty years, although I have freely partaken of cheese. Any considerable degree of exercise increased them, and this was also the case when I partook of any liquid, containing much sugar or molasses.

From my 18th to my 25th year, I was afflicted with hæmorrhage of the lungs and was compelled to travel, to go to sea, &c., and during that time I was not so much troubled with *Ascarides*; on an average, not more than two or three passed from me in a day.

I exchanged a northern for a southern climate, and my health gradually improved, and my consumptive symptoms have all left me.

But the change of climate did not relieve me from *Ascarides*, on the contrary, they grew every day more troublesome, inso-much that I was kept awake night after night, for years together, and finding no relief but by taking two or three injections of water, during the night. I am sure that I speak within bounds, when I say, that for fifteen years, there passed from me, on an average from two to three hundred *Ascarides* per day.

I cannot say that my bodily health was much injured by these worms, but the irritation they incessantly kept up, was very distressing, so much so, that for many years life has been a burden, and I found it was affecting my nerves, and with it my temper.

I applied to physicians, and made use of various remedies, all of which afforded me but temporary relief. I took castor oil and magnesia for a whole summer—I was weakened, but not much benefitted. I made use of injections of vinegar and water, one of these would relieve me for a whole day, and destroy every worm within the lower part of the rectum, but I began to think that this was injurious to the intestines, and increased that particular kind of mucous in which these worms are found. I spent two summers at the springs of Saratoga, and had at one time great hopes that these waters, which caused the worms to be evacuated, and operated as a tonic to the intestines, would have cured me. The relief was only temporary. On my return to Carolina the *Ascarides* became as troublesome as ever. I then imported the Saratoga water, and in the course of three years used one hundred dozen bottles: the use of this water saved me from much misery, but I found I had to increase the dose, till three bottles in a morning scarcely operated as a cathartic. I then had recourse to salts; this so sickened and disgusted me, that I cannot bear to think of it to this day.

I remember once having tried the experiment of eating an excrescence growing on the cedar tree, called the cedar apple;

for a whole day the worms seemed quieted, and on the following morning I passed a pint of mucous, containing the remains of thousands of *Ascarides*: they had evidently been destroyed by the cedar apple. I thought I had found a specific. I procured a quantity of the cedar apples and had them made into pills, but it appeared to me that in their dried state, they had lost all their virtues, and I have since used them with some advantage, but not so decided as I once thought.

The medicines which you prescribed for me, I persevered in using for two months; you are acquainted with your prescriptions, and mode of treatment, allow me to say, that I think I have found most benefit from the preparation of aloes. I hope, that I can now say, that I am cured—for 6 weeks not a single *Ascarides* passed from me.”

This patient was placed upon the use of the Compound Tincture of Aloes,  $\mathfrak{z}\text{ij}$ . or  $\mathfrak{z}\text{iii}$ . night and morning, and advised Enemata prepared with Aloes as directed. Finding that they were so readily discharged by the Tincture, he omitted the injections, though, at times, when irritation was experienced, he would apply cold water or tepid milk. The coldness of the fluid always gave relief, and with the evacuation of it, some worms were discharged. In a little time, by this course being pursued, his uneasiness was greatly abated. He proposed discontinuing the medicine. I advised him still to employ it, only at longer intervals, every other night or twice a week. This plan was pursued for two months, at the expiration of which time, the patient states, that he hopes he can now say he is cured. For six weeks not a single one passed from him. On one occasion he felt some irritation, and using an Enemata of cold water, three or four were voided, since which time, having felt no further return, he has not resorted to the medicine, though several years now elapsed.

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*Trichuris Vulgaris*.—The third species of round worm, or the long thread worm. This is of rare occurrence, and as there is no peculiarity of symptoms attending its presence, the same treatment may be adopted as for the *Lumbricus Intestinalis*.

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*Tænia or Tape Worm*.—One of the most difficult to be removed from the body. The reason of its being so difficult to expel is, that though portions of it are apt to break off and be discharged, it is endowed with a power of re-production, so that the patient is little or nothing better.

Of the anatomy of the *Tænia* little is known. I may be allowed simply to state that the body consists of a callous paren-

chyma, that they have no abdominal cavity, nor intestines, properly so called, nor anus. They are generally regarded as possessing some sensibility as oviparous. But what relates to the history of their generation, or of their nervous system is very obscure. We are also ignorant of the duration of their lives, and it is also impossible in the present state of our knowledge, to determine upon the extent of their increase.

The symptoms of this worm do not differ very materially from the foregoing. The most characteristic are, pain in the abdomen, with a turning motion or weight in the side, occasional prickings or bitings in the region of the stomach, with the evacuation per annum of small substances resembling the seeds of the gourd, which are the Vermes Cucurbitini.

Of the remedies for the Tænia,

*Polypodium Filix Mas*, or *Male Fern*.—This is a perennial plant, and grows in great abundance in almost every part of Great Britain. The only part used is the root which when chewed is somewhat mucilaginous and sweet, afterwards astringent and bitter.

The root is large, long, firm, and covered with thick brown scales, placed in an imbricate order, and furnished with many long tough fibres.

This article has long been held in repute as a remedy for Tænia.

It was known in the time of Dioscorides, and at various periods there have been published successful accounts of the manner of exhibiting it. It had fallen into neglect in the latter part of the last century, when it came into notice by being discovered to be the remedy which had become greatly celebrated in Switzerland, as a specific in the cure of Tænia. The secret was purchased by the King of France, Louis XVI., in 1775, after its efficacy had been attested upon trial by some of the principal physicians in France. The proprietor of the medicine was Madame Nouffer, whose reputation was very great in the treatment of this complaint.

The article of which her medicine was composed, consisted of the root of the male fern, gathered in the autumn, and reduced to a fine powder.

The manner in which it was directed to be used was the following.

Three drachms of the powdered root are mixed with four or six ounces of water. The whole is to be swallowed by the patient in the morning on an empty stomach. For children the dose is lessened to a drachm of the powder.

If the medicine produces nausea, which it is apt to occasion, the patient is directed to chew any thing which is agreeable,



but not to swallow it—or to smell the fumes of vinegar. Should the medicine be rejected another dose must be taken as soon as the sickness is gone off.

Within a few hours after a cathartic is to be exhibited, consisting of drastic articles, and when it has operated, the worm will usually be found to have been expelled.

Such is an outline of the practice pursued by M. Nouffer, and which had acquired much reputation. The efficacy of it is confirmed by Professor Brera, who states that he has cured seven patients by this remedy. The efficacy of the fern is also supported upon the authority of a number of ancient as well as modern writers, and seems fully entitled to be considered a valuable remedy in the treatment of this troublesome disease.

In Dr. Chapman's Therapeutics, a case is related by Dr. Jones of New-York, of a lady, who after taking numerous worm medicines, with little or no effect, drank a decoction of fern, a pint a day, until some gallons were consumed, when a worm came away measuring forty-five feet.

The usual mode of administering the fern is in the dose of  $\mathfrak{z}\text{i}$ . to  $\mathfrak{z}\text{iii}$ . in water or syrup, repeated two or three mornings in succession, fasting, and then followed by a full dose of some active cathartic.

It is given also in the form of extract, prepared by digesting the root cut small in a sufficient quantity of Sulphuric Æther. The tincture is then pressed, concentrated by distillation, and the æther fully removed.

From a pound of the root,  $\mathfrak{z}\text{xiii}$ . of a brownish thick extract is obtained.

The extract contains not only the volatile oil of the fern, but also a fixed oil, tannin, acetic and gallic acids, a muco-saccharine matter, green and red colouring matter, and a semi-resinous substance.

Eighteen to twenty grains given at bed-time, and the same quantity in the morning fasting, destroyed Tænia, so that on the administration of a cathartic, the parasite was discharged, often in the form of a ball. Recommended by Hufeland.—*Dunglison's New Remedies*.

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*Oil or Spirits of Turpentine*.—From observation and experience, the oil of Turpentine may be regarded as one of the best and most certain means of procuring the expulsion of this and other intestinal worms.

Its good effects in diseases arising from Lumbrici, are well known, and the periodical Journals contain many cases of its successful application to the cure of Tænia.

This worm from the very unpleasant symptoms produced by it, and the difficulties which exist in its removal, may be regarded as among the most unpleasant afflictions to which the system is liable.

The Spirits of Turpentine from the reports in Europe and this country, may be considered as the most effectual means hitherto discovered for its expulsion.

The earliest mention which is made of the medicine is by Dr. Bateman, in the *Edinburg Journal*, for April, 1810. and it is stated that a Dr. Fenwick having discovered that the oil of Turpentine had been used by a mechanic, with considerable success in the expulsion of the Tape worm, it had been employed by several physicians in the public charities of London, and it appeared to be an active antidote to that troublesome animal in a great majority of cases.

To be effectual, it must be given in large doses, from half an ounce to  $\text{ʒi.}$  and even  $\text{ʒii.}$ , and its exhibition is usually followed in a few hours by a considerable cathartic operation, and a discharge of *Tænia*.

The principle upon which its virtues depend, does not seem to be distinguished by the true cathartic character. The medicine has the power of resisting absolute decomposition, by the assimilating operations of the organs of digestion, passes along the intestines in a great measure unchanged, and was observed by Dr. Lettsom floating upon the surface of an evacuation.

The Turpentine then comes in contact with the worm, and by the influence of a specific property deprives it of life. By this means it is brought into the state of inert matter, and thereby subjected to the expulsive action of the organ, whose cavity is the place of its production, and whose function its existence disturbs.—*Kennedy on Intestinal Worms.*

In the doses I have mentioned it does not produce any more uneasiness than so much gin, and is best given in milk. It should be taken early in the morning and on an empty stomach.

In a large dose it is less apt to produce uneasiness of the bladder, or in going to stool, than in small doses, because the medicine is carried off speedily by the bowels.

The constitutional symptoms which follow its use, are, giddiness to a great degree, as if the person was intoxicated, which comes on shortly after taking it, and continues for an hour or more, when it subsides with the cathartic operation. It is stated by Professor Brera, that in a few cases in which it has failed to expel the *Tænia*, it has commonly afforded great relief to the painful feelings which were believed to originate in the presence of the worm.

I might cite a number of cases from periodical publications of the beneficial effects which have been exhibited by the oil of Turpentine, but they would be too lengthy in detail. I shall refer you to the *Eclectic Repertory*—*The Review of Professor Brera's work—the Medico Chirurg. Trans. Vol. II.—Journal of Foreign Medical Science, Vol. III.*

*Sesquioxide of Iron, Rust of Iron.*—Of the medicines for Tænia, Dr. Rush thought none were more safe and certain than the Rust or Sesquioxide of Iron. Taught by an old sea captain, who was cured of a Tænia by this medicine, Dr. R. has given from  $\text{ʒij.}$  to  $\text{ʒss.}$  every morning for three or four days, not only with safety but success. Treacle or jelly are proper vehicles to give medicines of this kind to children, but they must not be mixed with them till the moment they are to be taken, otherwise the vehicle will taste strongly of the metal.

*Cathartics*—Have been used in a greater or less degree in this affection, and it has been said with much success. Those used have been of the drastic nature, and given in such doses as to produce active catharsis, have succeeded in expelling large portions of the Tænia. Of the cathartics employed, the Mercurials have been much esteemed. Also Jalap—Colocynth—Scammony, and Gamboge. The last article has had some reputation, and enters largely into the composition of several nostrums for Tænia.

Werlhoff's remedy for the Tape worm was Gamboge alone. He used to give it morning and evening to the extent of twenty grains, mixed with a little sugar and water, repeating the same the next day, if necessary, and even the third day. He never observed any harm to arise from these large doses, the patient being generally as well as ever the day after the exhibition of the medicine.

Besides these, various other remedies have been employed, as Arsenic—Assafoetida—Tin.

If the powdered Tin is preferred, the following is the mode of administering it.

Powdered Tin,  $\text{ʒiii.}$

Conserve of Roses,  $\text{ʒiii.}$  syr. q. s. to make an electuary.

One to two table-spoonsful to be taken for a dose in the morning. The dose to be repeated for three mornings in succession. The day before the first dose and the day after the last dose of the medicine, the patient is to be purged with an infusion of Senna and Manna. This powder immediately cures the pain in the



stomach, occasioned by the worm, even though it does not bring them away until some time after.

*Punica Granatum.*—*Pomegranate.*—The bark of the root of Pomegranate has been recommended as a remedy for *Tænia*, and a number of cases stated as cured by its use.

It may be given in the form of powder, viii. grs. to ℥i. two or three times a day. The most usual mode is in decoction, in the following manner.

Bark of the root of Pomegranate, ℥ii.

Water, one pint and a half, boil to a pint.

℥ii. are given for a dose every half hour until the worm is expelled, which generally occurs twelve hours after the first quantity has been administered.

If the decoction is of greater strength it excites considerable nausea and griping. It also acts upon the nervous system, producing vertigo, tremblings, and the sensation of intoxication, with other symptoms indicative of a poisonous quality in the bark.

The experiment has been made of placing living *Tænia* in a decoction of the bark, and it was observed that the instant they were plunged in these preparations they writhed, and otherwise manifested great pain and died in the space of five minutes. That their death in these cases arose from the influence of the bark is evident, as these worms live several hours after expulsion, when kept in plain tepid water.

In the treatment of worms we must not confine our attention to the mere expulsion of the worm, but endeavor to give tone to the stomach and bowels, by the use of tonics, so as to prevent their re-production.

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## DIVISION V.

### ANTACIDS.

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## DIVISION VI.

### *Medicines which promote particular secretions.*

#### DIAPHORETICS.

Before I proceed to consider the manner in which this class of medicines increase deficient perspiration, it may be useful and interesting to give some account of the secretion in a healthy state. Of all the natural evacuations none are so important, or so exten-

sive, and none free the body from so many impurities as the function in question.

Perspiration is a subtle invisible vapour, continually flying off from the surface of the body, though ever so well protected by clothes, and is found to contain several excrementitious substances. For the discovery of the nature, importance, and extent of perspiration, we are indebted to the celebrated Physician Sanctorius, who established, by the labor of thirty years, the existence of this discharge beyond the possibility of doubt, and whose doctrines have since been sanctioned by the experiments, and supported by the authority of many able men.

It appears that a considerable discharge takes place habitually from the skin though in a form not perceptible to our senses. This has been called insensible perspiration, and it may be demonstrated by holding a highly polished metallic surface to the skin, when a watery vapour collects upon it and clouds it. Under ordinary circumstances the whole discharge is evaporated, and passes off in this invisible form.

When this secretion is increased by any cause, as by violent exercise, it becomes sensible perspiration, and is commonly denominated sweat. This, as I have observed, is only an increased quantity of the same kind of fluid, as the insensible perspiration, <sup>very</sup> small particles are observed on the skin, and they unite into larger drops.

Heat, as it is the most powerful means of exciting the action of the heart and arteries on which this phenomenon depends, is the most common cause of sweating: strong bodily exercise, warm food, and other causes produce the same effect.

The quantity of the cutaneous discharge cannot be easily ascertained, but it may be supposed to be very great, as it is constantly going off through innumerable pores every where spread over the surface of the skin.

When to this we add the extent of the exhaling organ, and the quickness with which we can see the perspiration produced, we shall expect to find the discharge very considerable. Sanctorius has computed its quantity, in the warm climate of Italy, to be equal to five-eighths of the substances taken. In this estimate he has not been followed by other experimenters, and it seems probable that it varies according to the temperature of the climate. In other climates, as in England, Ireland, and even South-Carolina, according to the experiments of Dr. Lining, the quantity of urine is greater, and of course less is discharged by the skin.

We may be safe in stating, that in a person of middle stature, and in perfect health, the quantity of perspiration will vary from three to four, and even five pounds in the twenty-four hours.

The importance of this secretion may be judged of from the uneasy feelings produced by its suppression, and from the number of diseases which originate in, or are aggravated by an interruption of its free discharge.

A few words upon the nature of this secretion, will close what I have to say upon this subject.

From the very insensible manner in which it escapes from the skin, there is some difficulty in collecting it in sufficient quantity for examination. It seems to be in a great measure aqueous, holding in solution several salts, the excrementitious matter of animal substances, and sometimes acids. It possesses sensible properties, causing the peculiar odour of the body, which is very remarkable in particular individuals, as possessing peculiar characters in some races of mankind.

Having premised these observations, I shall enter upon the consideration of Diaphoretics.

The medicines of this class increase the deficient discharge by the skin, whether in the form of insensible perspiration or by sweating.

In the common language of writers, the term Diaphoretic is applied to those medicines only which promote the insensible perspiration, or the slightest moisture on the skin, and those which occasion sweating, they distinguish by the term sudorific.

But as in the medicines arranged by authors under these titles, we can find no difference, except in the degree of activity, or what arises from the manner of administration, we may comprehend the whole under the title of Diaphoretics.

The action of Diaphoretics may be arranged under three heads.

1st. Those which operate by exciting the action of the heart and arteries.

2d. Those which operate by producing relaxation of the cutaneous vessels.

3d. Those which are local in their operation, or which are applied to the surface of the body.

Diaphoretics produce their effects in the first place by increasing the general force of the circulation.

By this means the blood is propelled more forcibly into the minute vessels, and the secretory process is thereby promoted. Under this head are included all the stimulating Diaphoretics, and they appear to produce their good effects by evacuating the watery part of the blood, and lessening the quantity in the circulating system, thereby acting as depleting remedies. They also fulfil other indications, for by determining the blood from the internal parts to the surface, they relieve local congestions, remove the spasmodic stricture of the cutaneous vessels, and render the skin moist and relaxed.



Diaphoresis is not always a necessary consequence of increased arterial action, for a constriction of the exhalents may exist, which must be overcome, and this condition of the cutaneous vessels is often connected with the excited state of the arterial system; hence another Division of Diaphoretics, into those which produce relaxation of the cutaneous vessels.

Medicines of this class operate by their impression upon the stomach—producing nausea, and, with this, a diminution of the arterial action.

A reduction of the action of the heart and arteries, is attended with relief to that state of constriction of the extreme vessels, which checks perspiration, and hence relaxation is said to take place.

The intimate connection between the stomach and skin, I think, does not require proof, and the powerful influence of nauseating medicines, in exciting perspiration, must have been observed by most of you. The value, therefore, of this class of Diaphoretics, in diseases of high arterial excitement, after proper depleting remedies, is truly great. Under it, are included the Antimonials, Saline Diaphoretics, small doses of Ipecacuanha, and cold water. Dr. Currie, has observed, in the hot stages of fever, that few means operate more actively in exciting free perspiration, than copious draughts of cold water. The effect is explained, upon the diminution of febrile action, and proves the intimate connexion of the non-secreting condition of the skin, with the excited state of the arterial system.

The third and last mode of exciting perspiration is the application of stimulants to the surface of the body. This is done in several ways—either by the application of steam, to the surface of the body, or of heated air, as in what is called the dry bagnio—by the employment of bottles filled with warm water, or bags with hot ashes or sand to different parts of the body—by warm bathing, or the pediluvia, or by accumulating the warm effluvia of the body itself upon its surface. This is done by covering up the body very closely, so as to prevent the escape of the warm effluvia arising from it, at the same time to exclude external cold. But though the application of heat to the surface of the body, will, in general, excite perspiration, it will not invariably have that effect, but, on the contrary, it will, under a certain condition of the skin, rather impede, than promote the sudorific process. It is now distinctly understood, that in the hot stages of certain fevers, such as Typhus, Scarlatina, and several other forms of disease, there is a certain condition of the skin, marked by extreme dryness, and accompanied with great heat, which is increased by increasing that heat, by means of external covering and the exclusion of cool air. In this condition of the body, cold affords the only means of

removing the febrile constriction, and cold is in fact the only sudorific under such circumstances. Dr. Currie has extended this principle, and from him, the practice of sponging and the affusion of cold water, has been introduced in fevers. In other conditions of the skin, unattended with this dryness and great heat, warmth to the surface contributes to the free performance of the secretory process.

I have frequently mentioned the beneficial effects which arise from medicinal combinations:—they are not less obvious in this class of medicines.

I have divided Diaphoretics into such as excite the circulation, and such as produce relaxation of the surface. It is obvious, that if the surface of the body could be placed in a proper condition for the discharge of sweat, while the circulation is at the same excited, the object would be more readily obtained. Thus, the beneficial effects which arise from a combination of opium with Ipecacuanha, or the antimonial preparations, may be accounted for. The primary effect of the opium being to increase the action of the vascular system, while that of the Ipecacuanha or antimony by its nauseating effect, diminishes the action of the surface, or produces relaxation. Hence, while the circulation is increased, the skin is placed in a situation for the free discharge of perspiration. Another beneficial effect arises from this combination, viz: the sudorific by being determined to the skin, prevents the unpleasant effects of opium upon the brain, while its anodyne operation is obtained; for opium, given when the skin is dry, or not accompanied with perspiration, is apt to occasion restlessness, rather than sleep, and to produce a degree of delirium. Thus the acknowledged value of Dover's powder, as a safe and active Diaphoretic and anodyne, is explained.

Several other instances might be added, as a combination of tartarized antimony with gum guaiacum, or gum guaiacum, tartarized antimony and opium; so true is the maxim, as Dr. Paris observes in this class, *vis unita fortior*.

As it is of importance in many diseases to produce diaphoresis, some Rules may properly be laid down for their exhibition, and for these I am partly indebted to Dr. Chapman's Therapeutics.

Rule 1st. During the exhibition of Diaphoretic medicines, it is most beneficial that the patient be confined to bed, and in some instances it is essentially necessary.

Rule 2d. The pulse and temperature of the skin are to be carefully watched. If the pulse be active, or the heat very great, diaphoresis cannot be induced until they have been lowered by venæ sect. or other depleting remedies, which should not be omitted unless contra-indicated.

This rule is of the utmost importance, since diaphoresis can

never be advantageously excited, until the inflammatory action of the system has been reduced.

The medicines of this class, are, let it be understood, secondary remedies, and are resorted to, when more vigorous means have failed, or cannot further be persisted in to subdue disease. When employed at a proper period they are of the utmost benefit, since they not only act as evacuants, but by determining the fluids to the capillaries, they relieve the larger vessels. The strength of their impression will be adapted to the existing action which they may change or subdue, while they will be wholly inefficient at an earlier period.

Rule 3d. While under the operation of the Diaphoretic, diluent drinks must be employed, unless the stomach be very irritable, or unless the antimonials have been exhibited, for in either case they may produce vomiting. The temperature of the drinks must depend upon that of the surface—for if the skin is very hot, cold drinks are preferable, if the skin is cold and the system feeble, warm drinks are to be given.

Rule 4th. After the perspiration has subsided, the patients linen should be changed, and he should be removed to a dry bed, or a dry part of the bed. The clothes under such circumstances become highly offensive, and in addition, tend much to check the perspiratory process.

Rule 5th. Guard against a sudden suppression of perspiration. This rule is of great importance, whence it is often necessary to watch patients while asleep. I have more than once known relapses take place from this cause, which had very near proved serious. One instance in particular, occurs to my mind, in which a female laboring under a pulmonary affection, had her symptoms suddenly aggravated by the bed clothes falling off when asleep, and while perspiring freely.

Rule 6th. Avoid purging, during the administration of Diaphoretics, for it may suppress perspiration by a revulsive action, and will render necessary a frequent exposure to cold.

Rule 7th. Avoid, during the use of Diaphoretics, those which increase the secretion by the kidneys.

These directions are but little considered in ordinary practice, it being very common to hear of medicines being directed with a view to a purgative and diaphoretic operation, or a diuretic and diaphoretic action. Physicians too often flatter themselves, that they can accomplish more than is compatible with the laws of the animal economy. The functions to which I have reference, are always opposed to each other—whatever will excite one, will diminish the other.

Rule 8th. When long continued perspiration is required, as in chronic rheumatism, flannel should be substituted for linen, next



the skin, without this, it will be impossible to keep up a uniform and constant perspiration. The old practitioners used to employ flannel in all cases, but it would be very injurious in acute or febrile affections. In these, frequent changes of linen is highly comfortable and refreshing.

Thus it is, that Diaphoretics, judiciously employed, are a very important class of medicines. Their effects are to determine to the surface, remove internal congestions, obviate constriction of the extreme vessels, promote the cuticular discharge, and diminish morbidly increased action, by lessening the quantity of the circulating fluids. As they are so powerful, they ought not wantonly to be trifled with, and the popular prejudice in their favour in every disease, is, in some cases, highly injurious.

#### DISEASES IN WHICH DIAPHORETICS ARE USEFUL.

In Remittent and Intermittent fevers, after proper evacuating measures have been employed, Diaphoretics are very useful in allaying febrile action. These diseases sometimes terminate naturally by perspiration, and hence these remedies seem indicated by nature to put a stop to the paroxysm. Before their good effects can be experienced, however, the alimentary canal should be well evacuated, and the excited state of the heart and arteries, in some measure reduced. When judiciously applied, they conduct the paroxysm to a close—they sometimes prevent its recurrence, and thus break the catenated motions on which the disease depends. As a preventive of the approaching paroxysm, the stimulating Diaphoretics are preferable, but to conduct it to a crisis, the relaxing ones are to be employed. According to the character of the fevers, and the state of the pulse, must we be decided in our choice of the stimulating or relaxing Diaphoretics.

In Continued fevers they are equally necessary. It was the practice at one time, to give stimulating Diaphoretics even in the most inflammatory fevers, confining the patient to a hot room, and preventing the ingress of fresh air. This treatment only served to aggravate the symptoms. The heat of the patient becomes insupportable, attended with delirium, and great determination to the brain, redness of the face, inflamed eyes, beating of the carotids, &c. In this state, sometimes, a profuse sweat breaks out, but it brings no relief, and does not diminish arterial action. When Diaphoretics are properly employed, they are most important medicines in these fevers. It will, however, be distinctly understood, that in this, and all inflammatory diseases, V. S. and other depleting remedies should be used, before we have recourse to this class of medicines, and even then, that the milder ones are to be resorted to. Without attending to the stage of the disease,

and the proper adaptation of remedies to it, our practice is but empiricism, and we shall be more likely to do mischief than good. In diseases as in conduct, there is a time for every thing, and the success of our treatment, is, perhaps, not more influenced by the remedy, than the time and manner of its administration.

Diaphoretics have been much recommended in fevers supposed to originate in contagion, as Small Pox, Measles, &c.

Among the Humoral Pathologists, it was considered that the particles of virus which kept up the disease, could be eliminated through the pores of the skin, and hence their first remedies were of this class. They are doubtless very serviceable in these cases, but they have no peculiar or specific action, and their use is to be governed only by the state of the system.

In no class of diseases are Diaphoretics more useful than in the bowel affections. These diseases are intimately connected with an inflamed condition of the vessels of the intestinal canal, and as there exists a very intimate relation between the cutaneous capillaries, and those of the internal organs, it is obvious, from the general effects of Diaphoretics, that they must prove salutary in these affections. They will not only act as general depleting remedies, but also, in an especial manner, draw off the fluids from the vessels of the affected parts, and thus aid very materially in the reduction of the disease.

The influence of the morbid condition of the cutaneous exhalents on those of the bowels, and vice versa, is often manifested in a very conspicuous way. We observe, for instance, dysentery, diarrhœa, and inflammation of the bowels, to ensue from the sudden suppression of perspiration; and, on the contrary, these diseases, from whatever cause they may arise, are almost always relieved by the cutaneous secretion being restored.

Diaphoretics, therefore, in these cases, by exciting free perspiration, diminish the intestinal secretions, restore to the bowels a degree of regularity, the more perfect, in proportion as the cutaneous discharge is more free and abundant. By exciting the cutaneous emunctories in these affections, therefore, we break the chain of morbid action, equalize the circulation, and give an exit to those excrementitious matters which nature designed to be cast off by the skin, and whose retention cannot but prove injurious to the animal economy.—*Eberle, M. M.*

In Catarrhal Affections they are of the utmost importance. I have succeeded in protracted cases by the use of emetics every other day, or twice a week, in the commencement of my treatment, and administering Diaphoretics during the interval.

In many of the affections of the lungs they are very useful, and in these cases particularly, it should be recollected, that there is no part of the system upon which revulsion can so easily and so ef-

fectually be made, as by the skin. In acute cases the relief is sensible and immediate. The cough, shortness of breathing, general uneasiness and distress, seem to be commensurate with the want of a free discharge by the surface.

Of the utility of Diaphoretics in Rheumatism, I believe there cannot exist the slightest doubt. They can only be employed advantageously after inflammatory action has been subdued by V. S., and purgatives; and in general, their efficacy is much increased by being combined with opium.

When the disease becomes chronic, with rigidity and stiffness of the joints, with irregular muscular action, this action being in some instances so much impaired, that locomotion cannot be performed, and in other instances so much contracted, that the limbs are distorted and drawn in the most unnatural positions, with the skin dry and cold, the functions feebly performed, and the general health much impaired, the treatment pursued is directed to a renewal of the energies of the cutaneous vessels, by clothing in flannel, flannel bandages, stimulating diaphoretics, alterative medicines, bathing, general and local, the vapour bath, &c. In many cases these means are sufficient, and health is frequently restored. Some cases, unfortunately, resist them all, and here, I wish to bring to your notice, the natural resources of the country, and the efficacy of the warm and hot springs of Virginia, in exciting the secretory functions of the skin, and thus restoring health.

The springs are situated in Bath County, Virginia. At the warm springs a large bathing house is erected, thirty feet in diameter, and persons resort to them for the purpose of bathing simply, and an indulgence in the delightful sensations experienced by the agreeable temperature of the water. This temperature is about 96 degrees Fahrenheit, and the depth of the bath is five feet.

The hot springs are resorted to by persons labouring under rheumatic affections, inveterate gout, and slight hepatic derangements. These springs are in the same county, about five miles distant, and at them are established baths of different temperatures, 96, 103, 107. The first is principally used for cleansing the skin, and the second to accustom the system to the greater heat of the third. The patient then being prepared by frequent immersions in the second bath, enters the third, and remains in it fifteen or twenty minutes. This is as long as it is safe to remain. The heat of the bath produces languor and lassitude, determination to the head, exhibited in flushed cheeks, inflamed eyes, head ache, and slight vertigo. After leaving the bath, the patient is placed on a mattress and covered with four or five blankets, under which he remains fifty or sixty minutes. During this time the perspiration flows immoderately, insomuch that the bed clothes are thoroughly



wetted. He is then wiped dry and dressed, and no great degree of exhaustion is felt, after undergoing this free perspiratory process. The treatment is continued every other day for weeks, and in very protracted cases, months. Several cases could be related of persons who had been afflicted with Rheumatism for years, with all its distressing effects, as contraction of the limbs, inability to walk, or even to exercise the power of volition over the affected parts, with pain so severe, that sleep could only be procured at intervals, yet, by a perseverance in the above course, for weeks, and when necessary, for months, have been greatly relieved, and many entirely cured.

The above facts I derived from a medical gentleman, a subject of rheumatism, who had experienced the good effects of the baths, after eight months suffering, and witnessed in others, afflicted as I have described, the wonderful changes which were produced by a perseverance in the above course. With pleasure I communicate them to you, particularly as illustrating the beneficial effects produced by depletion, through the channel of the skin, in one of the most painful and distressing diseases to which the system is liable.

Lastly. Diaphoretics have been much recommended in Dropsies. At one time it was usual to treat Dropsies by sweating alone, and this practice is now renewed on the continent of Europe. In a short account of the diseases of the Western Indians, written by Dr. Hunter, I observe that the treatment of this disease by sweating, is very common among them. It is effected by means of the sweat oven, or by internal and external sudorifics. Their mode of sweating without the sweat oven, is to give warm teas very liberally, and to cover up the patient very closely. When the patient is able to walk, the sweat oven is always resorted to, and as the sweating place is generally some distance from the village, they are frequently carried to it, in blankets, by their friends. Here, placed on a mat, the patient sits enveloped in a vapour, arising from water poured on hot stones, and plants of different kinds, whose virtues are supposed to unite and ascend with the vapour. Sweating teas are taken very freely, during the patient's continuance in the oven, where he remains until the perspiration ceases to flow. The debility induced by this treatment, is sometimes so great as to make them faint, and experience the most unpleasant feelings, which, however, followed by proper treatment, generally have a happy effect. The treatment is continued with the use of Tonics. The practice has been occasionally very beneficial in this disease.

There are some forms of dropsy in which sweating may be of considerable service, and by its centrifugal power, may remove obstructions of the viscera, and restore the equilibrium of the circulation between the surface and the viscera.

But the pathology of Dropsy is so obscure, and the removal of the effusion merely, is so small a part of its treatment, that I think too much reliance is not to be placed upon it—still sweating may often relieve very unpleasant symptoms, and even cure sometimes. Capt. Cook relates having been cured of a dropsy, in one of the South Sea Islands, by being buried up to the neck in warm sand, which could only have operated by exciting free perspiration.

To these diseases, I might add many others, in which the beneficial effects of this class is exhibited. Enough, however, has been said, to direct the general administration, and as respects their special application, much must be left to your sagacity and experience hereafter.

#### PARTICULAR DIAPHORETICS.

Having given you a brief account of perspiration—of the mode of operation of Diaphoretics, and their application to diseases, I shall proceed to the separate articles which compose this class, commencing with the stimulating Diaphoretics.

The first of these is *Opium*. Of the natural history and properties of opium, with its application to diseases, I shall expatiate fully, when treating of it, under the head of Narcotics. Only its Diaphoretic property will be noticed at this time. This property, is intimately connected with the power which opium possesses, of stimulating the action of the heart and arteries, and that in a manner corresponding in its effects, with other stimulants, upon a healthy body.

That opium is stimulating, is evinced in its producing vigor of body, and cheerfulness of mind—in its exciting passion and emotion, in inducing watchfulness, dissipating sadness, and inspiring resolution, and lastly, when taken in immoderate doses, occasioning giddiness, imperfect speech, full pulse, quick breathing, nausea, vomiting, convulsions, and death.

In all these respects, it is strongly allied to other articles, which are indisputably stimulant. The influence of opium is particularly exhibited where great mental exertion is required. Dr. Brown informs us of a gentleman, who was anxious to accomplish a literary composition, which required an uninterrupted exercise of his mental faculties, for more than forty-eight hours, who was enabled to perform it, by supporting himself with stimuli. The last that he had recourse to was opium. Dr. Leigh also felt the same energetic effects from opium. Finding himself, one night at 11 o'clock, more disposed for sleep than usual, he took thirty drops of laudanum, which produced such enlivening effects, as enabled him to prosecute the study in which he was then engaged. In

this cheerful situation he remained till one o'clock in the morning, when, being overcome with drowsiness, he took ninety drops more, which soon roused him, and enabled him to engage in business. This disposition, he says, continued but a short time. He soon found himself so exhilarated, as to grow careless of his occupation, and rather inclined to indulge in an excess of gaiety. The powers of his mind still remained so perfect, as to enable him to attend to his conduct, and examine the state of his pulse, which was strong and full.

To these facts we must add the practice of taking opium, so common among the Persians and Turks. The free use of opium among the Persians, appears to have been introduced to allay the uneasiness and troubles of old men, in great places, who were forbid the use of wine by Mahomet.

They say it entertains their fancies with pleasant visions and a kind of rapture. The Turks declare that they cannot live without opium, unless wine is given them in its place, and even then they are not content, as they say, the wine does not operate so powerfully on them as opium.

The Turkish messengers when sent on business of haste, always carry opium with them, and take largely of it when tired. They say that it immediately gives them strength and spirits to proceed, when taken with proper precaution.—*Chardin's Travels*, quoted by Dr. Leigh.

Many other facts might be adduced, to prove the stimulating powers of opium, in a healthy state of the body, but those I have mentioned, will be sufficient.

If we examine the effects of opium in certain diseases, we shall find new proofs of its stimulating qualities. Do we not see it recommended every day in those of the greatest debility. Dr. Cullen, in speaking of the cure of intermittent fevers, says, "It appears to me clearly, that the recurrence of the paroxysm in intermittent fevers, depends upon a recurrence of a state of debility, and this is to be prevented, either by the use of tonics or stimulants, which may excite the action of the heart and arteries, and support that excitement till the period of accession is over." After mentioning several medicines which possess that power, he speaks of opium as one of the most effectual for the purpose.

The use of opium in the low stages of Typhus fever, is a very common practice, and its effects are highly beneficial. Dr. Rush speaks very favorably of it, and I have frequently seen it employed with advantage, in cases of Typhus fever, in the Alms House at Philadelphia.

I have been particular in illustrating the stimulant action of opium, because it has been a prevailing opinion for many years, that it possesses a directly sedative operation.



From the decided manner in which the intellectual operations are quickened, under its use, and from the evil consequences which follow its improper employment in inflammatory affections, there can be no doubt that it possesses stimulating properties.

As a diaphoretic, it is rarely used alone, but is generally combined with some other article, which modifies its stimulant operation, and determines it to the surface. It enters largely in most of the prescriptions which are directed with a view of exciting perspiration, and in all of them its effects are eminently beneficial. It is most commonly combined with Ipecacuanha, or antimony, and may be prescribed in substance, or in a fluid form. A grain of opium and a 1-4 or 1-6 of a grain of tartarized antimony, will often act as a diaphoretic.

But combinations of laudanum with antimonial wine, or dulcified spirit of nitre, are a neater, and perhaps a still more efficient prescription.

The following is the usual formula:

℞. Laudanum, drops xxv.

Sweet Spirits Nitre, ʒi.

Antimonial Wine, drops, xxv.

Water, ʒi.

To be taken as a draught.

This is well adapted to catarrhal affections, or when moderate diaphoresis is required.

It is principally in combination with Ipecacuanha, that its best effects are displayed, and that it becomes adapted to a variety of diseases. Where free perspiration is required, it is well adapted, and by being directed to the skin, or some secreting organ, the inconveniences of opium are obviated, while at the same time, it tranquilizes the nervous system. In all chronic and painful affections, it may be prescribed with safety and advantage, particularly in rheumatism, gout, and dysentery. The efficacy of this combination is improved by being united with the Sulphate of Potash, for experience has proved that Ipecacuanha and opium, in the same proportions, have not the same effect without it. Its action may be purely mechanical, dividing and mixing the active particles more intimately, and it appears that the success of the remedy depends very much upon its being finely powdered. The union of these three articles, in the following proportions, constitutes the Dover's Powder,—℞. Ipecacuanha, one part—Opium, one part—Sulphate of Potash, eight parts.

In the whole circle of Diaphoretics, there is none that can at all be compared with it, either as regards certainty or general utility.

The advantage of it is, that it may be administered in inflammatory cases, after arterial action and general excitement have been subdued. For though opium may stimulate the arterial sys-

tem, the Ipecacuanha relaxes the exhalents, and a copious diaphoresis ensues—at the same time pain and irritability are diminished. The powder should be taken in bed, and the body kept warmly covered. No drink should be taken after it, for fear of exciting vomiting, till the perspiration begins to break out, after which plentiful dilution may be used. The dose of the powder is v. to x. grains, to be repeated every 3, 4, or 5 hours.

Lately, opium has been recommended by Dr Hamilton, combined with calomel, in inflammatory diseases, after general excitement has been reduced, for the purpose of exciting diaphoresis, or for the purgative or sialagogue operation. The practice is new, to employ opium in any stage of inflammatory diseases, and it has always been considered as pernicious in the highest degree, by reason of its lessening sensibility, while the actions of diseases were progressing—or as tending to produce stupor, and great cerebral derangements, Dr. Armstrong, however, assures us that these objections are without foundation, and that combined with calomel, an anti-inflammatory operation is exerted—first, by allaying general irritation, and then by the diaphoretic and purgative operation which takes place. Supported by such high authority, and the reasoning in its favour, the practice has been adopted pretty generally, and I may say with effects nearly corresponding with what might have been expected.

I have employed the combination recommended, in a severe case of Pleurisy, after general bleeding had been practised, and other depleting measures, with effects highly gratifying.

In inflammatory affections, it must have been remarked, that where the lancet and purgatives have been freely employed, great irritation often succeeds, which may sink the patient unless timely allayed. For this species of irritation, opium is peculiarly fitted, generally calming the turbulence of the system, and inducing tranquil sleep. Yet as a subdued degree of the topical affection, is frequently combined with this irritation, it is proper to unite some other article with it, as calomel, which combination obliterates every vestage of topical disease, by equalizing the circulation, and also, by inducing, in many instances, a peculiar relaxation of the whole system.

Such are the important effects derived from opium and its combinations;—effects which are often strikingly exhibited, and the importance of which, you will be fully sensible, when you are acting for yourselves.

It may not be improper to remark, that the prejudice which has so long existed against the use of opium, in inflammatory diseases, is now giving way—practitioners are becoming convinced of its utility in these cases. Its action has been too generally, and too strictly considered stimulant, without taking into consideration its

other properties. In Tropical countries, and especially in India, opium is given freely in acute diseases, and even in topical inflammation, after, or in company with venæ sect. and generally in combination with calomel. The utility of the practice has been long established in those climates, and it is getting more into use in this country.

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*Family Laurinæ—Laurus Camphora—Camphor.*

*Description of the Plant.*

Leaves—elliptical, pointed, triply ribbed.

Flowers in clusters, axillary, shorter than the leaves.

It grows to a considerable size.

Camphor is the product of two species of trees—the one called *Laurus Camphora*, a large forest tree, which grows wild in the Islands of Borneo and Sumatra. Every part of the tree gives out a strong smell of Camphor, and the wood is much sought after as a material for chests, drawers, &c., because its peculiarly aromatic smell, renders it impenetrable to ants, and other destructive insects.

The oldest trees are the best, and the camphor is found in perpendicular veins, near the centre of the tree, or concreted in the knots of the wood.

The natives, at the proper season of the year, cut the trees down, and the trunks and branches are divided into junks, from three to five feet in length. These they split into several pieces, and they discover the camphor, in a white concrete form, lying between the fibres of the wood. Having provided themselves with an iron instrument, shaped like a hare's foot, they lightly scrape out from the interstices of the wood, the pure concrete, taking care that no part of the wood is removed with it. This is the best camphor, and from its expensiveness is rarely obtained. The concrete camphor being removed, the natives continue their work with rather more force, and collect all the small particles, not being greatly solicitous to avoid detaching some of the minute woody substance. This being obtained, they industriously scrape off every part that has a camphorated smell, which being reduced to a gross powder, by the process of scraping, exceeds both the others in bulk. It is then refined.

The other species of *Laurus*, which yields camphor, grows in Japan, but does not afford the article so plentifully nor so good as the first. The camphor is not contained in concrete masses, so that in order to procure it, distillation must be had recourse to. For this purpose, the roots and extremities of the branches are cut into chips, and suspended in a net, within a sort of still, the bottom of which is covered with water, and the top fitted with an earthen head, containing a quantity of straw. The water is kept



boiling for a long time, at the end of which, the camphor is found sublimed, and adhering to the surface of the straw—the steam penetrating the net, and carrying the camphor along with it, to the top of the still, where it is deposited on the straw.

In this state it is imported into Europe, and is impure. It is of a greyish colour, in small grains, contains much dust and foreign substances. It is refined before being used.

For a long time the Hollanders were the only people who were acquainted with the process of refining, and almost the whole of Europe was tributary to them for this substance. The English and French have become acquainted with the manner of refining the article, and prepare it for themselves. The process consists in uniting 30 or 50 parts of quicklime with the impure camphor, and submitting the mixture to a new sublimation.

Spirits of wine is also used in its purification—by which the camphor is dissolved, and being subjected to distillation, the substance is deposited in the top of the still. But this process is ineligible from its expensiveness, and its being incapable of separating any resin, with which the camphor may be accidentally or designedly mixed.

Such is the usual account I have been accustomed to deliver, upon the natural history of this article. Of late, we are informed, that the article from Sumatra and Borneo, is not procured from the *Laurus Camphora*, but from a tree of a different genus. The *Dryobalanops Camphora*, which grows to a great height, in the forests, on the coast of Sumatra.

To procure the oil, which is even more esteemed than the camphor itself, in Eastern countries, it is only necessary to wound and pierce the tree, when it exudes from the orifices so made. To get the concrete camphor, the tree must be cut down, when it will be discovered in small white flakes, situated perpendicularly, in irregular veins, in or near the centre of the tree.

Besides the above sources, from which the camphor of commerce is obtained, the roots of the Cinnamon tree, of the Cassia, of the Sassafras, yield camphor by distillation, though not in sufficient quantity to compensate for the expense.

It is also contained in the oils of Rosemary, Mint, Sage, and almost all the aromatic plants.

Camphor so obtained, differs from that procured from the *Laurus Camphora*. The latter substance, when submitted to the action of nitric acid, aided by heat, undergoes decomposition, and camphoric acid is formed. The camphor obtained from the essential oils, and from the labiated plants, is not dissolved by the nitric acid, and camphoric acid is not formed. It is therefore questionable, whether this substance is identical with camphor.

*Qualities of Camphor.*—When purified it is a white brittle

substance, somewhat unctuous to the touch, and tenacious between the *teeth*—possessing a degree of ductility, which prevents its being pulverized, unless a few drops of spirit be previously added. It has a peculiar, fragrant, and penetrating odour, and a bitter, pungent taste. It is volatile, so much so, that it disappears speedily, when exposed to the atmosphere, at ordinary temperatures. It is dissolved by alcohol, æther, oils, and acids, and its specific gravity is less than that of water.

*Properties.*—I shall not, at present, enter upon the disputed question of the stimulant or sedative properties of camphor, or of its application to diseases, my object being only to speak of its diaphoretic virtues.

When taken into the mouth, it has an acrid, bitter taste, and when swallowed, it excites an uneasy sensation in the stomach, which may be imputed to the operation of its acrimony upon its upper orifice.

In its operation upon the system, this article is somewhat peculiar. In its sensible properties, it is doubtless stimulating, but it appears to exert but little action upon the pulse. It soon produces a strong tendency to perspiration, without the pulse being sensibly affected in quickness.

On this account, in Febrile affections, accompanied with a dry, contracted skin, it is often employed, combined with other articles, even when the excitement would seem to forbid it.

United with Tartarized Antimony and Calomel, a speedy, and effectual relaxation of the skin takes place, with copious perspiration, and for effecting these objects, no combination is better adapted.

In place of calomel, I occasionally substitute the Nitrate of Potash, and have often been pleased with its effects. The formula is as follows:—

℞. Nitrate of Potash or Saltpetre, ʒi.

Camphor, ʒss.

Tart. Emetic, g. i. m. and divide into 6 or 8 papers, one of which may be given every second or third hour.

To the above, calomel may be added, and sometimes opium.

In most of the formulæ in which camphor is employed, opium is conjoined, and with very considerable effect, a new substance being formed, different from either. For while it is known, that the employment of opium, is, in many persons, attended with inconvenience and disorder, a combination with camphor, prevents these disagreeable consequences, and determines gently to the skin. Certain it is, that I have often experienced more positive effects, from the union of these articles, than from their separate exhibition, and that without any deleterious results.

Dr. Clutterbuck recommends the union of these two articles, in the following proportions, as a powerful diaphoretic.

℞. Camphor, g. viii.

Opium, g. i. mix for a powder—to be repeated pro re nata.

When the proportion of camphor is smaller, very moderate effects follow—and the happiest consequences arise from this combination, in all uterine affections, requiring the use of anodynes.

As camphor is of a volatile nature, and its effects transient, it should be repeated at short intervals.

With respect to the exhibition of this medicine, it ought to be minutely divided before it is given, and this may be done by rubbing it first in a mortar with any powder, as sugar or nitre. But to be certain of a minute division, it is proper at the same time to add a few drops of rectified spirits of wine, or other such spirituous menstrum.

The dose of Camphor, as a Diaphoretic, is from two to eight grains.

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*Carbonate of Ammonia*, or the *Mild Volatile Alkali*. It is formed by the double decomposition which takes place, from the union of Muriate of Ammonia, and Carbonate of Lime—the carbonic acid uniting with the Ammonia, and the muriatic acid with the Lime. Muriate of Lime being formed, and remaining in the retort, while the Carbonate of Ammonia passes over, and concretes on the sides of the receiver. It is obtained in the form of a white chrySTALLINE mass, of a fibrous texture, which on exposure to the air effloresces. Its odour is pungent and peculiar.

The Carbonate of Ammonia, being possessed of stimulating powers, is found to be, in some degree, diaphoretic, though not as much so as the preparations made from it. It is employed with great advantage in the typhous forms of diseases, and in many gastric affections, particularly those succeeding habits of irregularity and debauch, and in cardialgia of puerperal women.

It is, however, of the Acetate of Ammonia, or Spiritus Mindereri, that I shall more particularly speak as a diaphoretic. It is formed by pouring upon Carbonate of Ammonia, as much acetic acid as may be sufficient to saturate the Ammonia—the carbonic acid gas escaping in the process. By this operation we obtain Acetate of Ammonia, dissolved in the water of the acetic acid.

This preparation was much used, but it has been supplanted by other less valuable medicines. It is entitled to more general use as a diaphoretic and febrifuge. Given in doses of a table spoonful every hour or two, it seldom fails to excite a free perspiration, assisted with warm drinks. Dr. Chapman thinks it is best adapted, to excite diaphoresis, during the paroxysm of an Intermittent. But as it is not very stimulating, it may be given with less caution than most other diaphoretics of this class, and applied to fevers



generally, where much heat and dryness of the skin exist, with this advantage, that it will readily be retained on the stomach, when most others would be rejected.

This medicine may be made very readily, and extemporaneously, by adding acetous acid to the carbonate in a phial, and by corking it, the carbonic acid is prevented from escaping, it unites, in consequence of the pressure, with the water, and forms a much more pleasant and agreeable mixture.

*Eupatorium Perfoliatum.*—This is an indigenous article, and possessed of many valuable properties. It grows in every part of the United States, and has been employed with considerable success, in several forms of diseases. The popular names by which it is known, are Thorough-wort, Boneset, Vegetable Antimony, Cross-wort.

It is a striking plant, recognised by its connate leaves, perforated by the stem.

There are a great many varieties of this genus, not less than twenty, many of them possessed of medicinal properties, but this in the most considerable degree.

*Description of the Plant.*

Leaves connate—perfoliate, rugose, tomentose.

Stem—villous, rising to the height of three and six feet.

Involucrum, many leaved, eight to ten flowered.

Corolla, small, white.

Seed angular—pappus scabrous.

It is chiefly distinguished for its diaphoretic properties, but it is also tonic, and emetic, according to its mode of administration. Every part of the plant is possessed of active principles, but the leaves and flowers contain them in the highest degree.

It has a bitter taste, combined with a flavour peculiar to the plant, but without astringency or acrimony. Exhibited in the form of a strong infusion, it seldom fails to excite profuse diaphoresis, and has proved eminently beneficial in the treatment of Intermittent and Remittent Fevers, and is often had recourse to, as a useful domestic prescription.

In the Yellow Fever of Philadelphia, in the year 1798, when the sweating plan of treatment was introduced, Dr. Rush's favorite diaphoretic was the Eupatorium, and such was its efficacy as to cause it to be entitled the Vegetable Antimony.

In the late *Typhoid Pneumonia*, which prevailed with so much mortality, in different parts of the United States, many instances might be related of the efficacy of the Eupatorium as a sudorific and tonic, after proper evacuations had been employed.

Its value in Catarrhal Affections is sufficiently evident, and it may be considered as particularly well adapted to these cases.

Dr. Chapman remarks that not the least memorable application of this article, was in cases of this nature. Many years ago we had, he says, throughout the United States, a species of Influenza, which, in consequence of the sort of pain attending it, came to be denominated break bone fever. The Eupatorium acting as a diaphoretic, so promptly relieved this peculiar symptom, that it acquired the popular title of bone-set, which it retains to the present moment.

As a tonic, Dr. Anderson, who wrote a valuable inaugural dissertation upon this subject, remarks, that it possesses properties belonging to the Peruvian Bark, and he has related many cases of Intermittent fever, speedily and successfully cured, by the use of this article. He also cites, upon the authority of several distinguished practitioners, instances of its efficacy in the treatment of febrile disorders.

Of the efficacy of this plant, as a tonic, I should be disposed to think that its powers are much overrated, and should doubt whether it was entitled to more consideration *than* the Chamomile, and other articles of this class. Allowing it these qualities, it may be employed with much advantage in many cases of convalescence from acute diseases, when the digestive organs are debilitated, or in indigestion, restoring the tone of the stomach, and rendering the skin soft and comfortable.

Its effects will vary according to the manner of its administration—as a diaphoretic it should be given in warm infusion, and as it does not increase the action of the arterial system, in any considerable degree, it may be given in the paroxysm of fever. As a tonic it must be given in the form of decoction and cold, in substance or tincture. The active parts of the leaves and flowers are readily taken up by spirits, and are said to be most powerful in this form.

The dose in substance is from twenty to thirty grains, in a tea-cupful of the decoction. As a diaphoretic, a strong infusion, as much as the stomach will bear.

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*Family Apocynce—Asclepias Decumbens* or *Tuberosa*.—This is an indigenous article, growing in every part of the union, and in the neighborhood of this city. It is known by the familiar names of Pleurisy Root, and Butterfly-weed.

*Description of the Plant.*

Root—tuberous and perennial.

Leaves—scattered, sessile, on short foot stalks, hairy, long or lanceolate.

Stems—numerous, ascending or procumbent.

Flowers—bright orange colour.

All the plants of this class contain a considerable quantity of milky fluid.

*Medical Uses.*—The root of this plant has been long celebrated for its diaphoretic and expectorant properties, and has for a considerable time been employed in Catarrhs, Fevers, and Pleuritic affections. It produces its effects without stimulating the system in any great degree, and operates with mildness and efficacy, after the system has been reduced to a proper extent.

Dr. Parker, of Virginia, who has been in the habit of employing this root for twenty-five years, considers it as possessing a peculiar, and almost a specific quality of acting upon the organs of respiration, promoting suppressed expectoration, and relieving the breathing of pleuritic patients in the more advanced stages of the disease. Dr. Chapman in speaking of it, says, that as a diaphoretic it is distinguished by great certainty, and permanency of operation, and has this estimable property, that it produces its effects without increasing the force of the circulation—raising the temperature of the surface, or creating inquietude or restlessness. The common notion of its having a peculiar efficacy in pleurisy, is not altogether without foundation. Certain it is, that it very much relieves the oppression of the chest in recent catarrh, and promotes expectoration in the protracted pneumonies. It cannot be considered or entitled to any higher consideration than as an auxiliary, and should only be resorted to when the force of the disease has been reduced by more active means.

The best mode of administering it, is in the form of a strong infusion, in doses of a tea-cupful every two or three hours. It may also be given in substance, in the quantity of twenty or thirty grains, several times a day. For a description of this plant, vide *American Medical Botany*.

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*Family Aristolochiæ*—*Aristolochia Serpentaria*, or *Virginia Snake Root*.

The root of this plant is perennial, and composed of a number of small fibres, proceeding from a common trunk, externally brown, internally white.

The stems are slender, round, crooked, jointed, and are about 8 or 10 inches in height.

The leaves are few, ovate, entire, pointed.

Flowers at the base of the stem, lying on, or sometimes under the surface of the earth.

*Serpentaria*, has an aromatic smell, approaching that of Valerian but more agreeable, and a warm, bitterish, pungent taste, which is not easily concealed, or over powered by a large admixture of other materials. It communicates its qualities to water and to spirits, but most to the former. A quantity of this root subjected



to distillation, affords a whitish pearly fluid—very strongly impregnated with the aroma, but less of the bitterness of the root. On standing, the fluid deposits round the edges of the vessel in which it is received, a considerable number of small white chrystals, which are found to be camphor.

The medicinal property of this article which we are to consider is its diaphoretic, and this is so obvious that it is justly entitled to be regarded in this place. It is also, in a considerable degree, stimulating, insomuch, that it is not usually employed until the excitement of the system has been reduced by evacuating measures. Under these circumstances it will be found highly beneficial, not only in exciting free diaphoresis, but also in allaying the irregular actions attendant on great febrile debility. Employed, therefore, in the advanced stages of fever, and those attended with Typhoid symptoms, this article may be resorted to with the greatest advantage, alone, or in combination with wine whey, or other articles. It is, under these circumstances, very advantageously united with Camphor, or the dulcified spirits of Nitre, as in the following formula :

R. Infusion of Serpentaria,	℥xii.
Camphor,	℥ss. to ʒii.
Sweet Spirits of Nitre,	℥ss.
White Sugar,	℥ii. m.

Rub the Camphor with the sugar until it is reduced to a fine powder—add the Spirits of Nitre, and then the Infusion—strain.

Dose, ℥ss. to ʒi. repeated frequently.

Employed in the form of a warm infusion, it becomes a very useful article in the secondary stages of Pleurisy, Rheumatism, and other winter complaints.

A circumstance operating greatly in its favour, is its agreeable taste and aromatic odour, insomuch that it will in general remain well upon the stomach, and can therefore be taken in considerable quantities by most persons.

I shall again treat of this subject under the head of Tonics, and will defer for the present any further remarks.

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*Asarum Virginicum.*—Of the same natural family, and closely allied to the preceding article in its properties, is the *Asarum Virginicum* or Heart Snake Root.

The roots are perennial and fibrous.

Leaf, solitary, heart shaped.

Flower sessile, and nearly concealed in the ground, of a greenish purple to a dark purple, flowering in April or May.

The leaves as well as the root, have an agreeable, aromatic, bitterish taste, and for these purposes has been employed as a stimulating diaphoretic. In this respect it is fully equal to the

*Aristolochia Serpentaria*, and may very well be employed in the same diseases in which that article has been recommended, or may be substituted for it. It is prepared and administered in the same manner.

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*Asarum Canadense* or *Wild Ginger*—Is very similar to the foregoing.

Its roots are perennial.

Leaves radical, long petioles, kidney shaped.

Flowers, solitary, purple.

Properties similar to the foregoing—application the same—forms of administration the same.

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*Family Araliaceæ*—*Aralia Spinosa* or *Prickly Ash*, is another of our native articles deserving attention. The plant is found growing in our richest soils.

The root is perennial—shooting up straight unbranching stems, naked and prickly below, with the leaves crowded on the summit of the stem like the palm trees.

Leaves bipennate.

Flowers in a large terminal panicle or bunch.

The sensible properties of this article are exceedingly pungent and acrimonious, and there is experienced, soon after swallowing, a considerable degree of heat and warmth of the stomach, with a general glow upon the surface.

It is considerably stimulating, and a very certain diaphoretic. The disease in which it has chiefly been used is Rheumatism, and the part preferred is the bark of the root. A saturated tincture is made, and as much taken as can be borne without exciting sickness or vomiting.

In the chronic forms it is well adapted, and may be employed with advantage on occasions, when other articles have been unavailingly exhibited.

The dose of the tincture is a tea-spoonful three or four times a day, in a little water, gradually increased to ʒss. It is also used as an ingredient in diet drinks—and in the form of an infusion made strong, is an active emetic.

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*Family Rutaceæ*—*Guaiacum Officinale*, also *Lignum Guaiacum*, and *Lignum Vitæ*.—The tree from which the gum resinous substance, so commonly to be met with, is obtained, is a native of South America and the West India Islands, and grows to a considerable size. The wood is extremely ponderous and solid, very resinous, of a blackish yellow in the middle, and of a hot aromatic taste.

From its possessing the properties of the gum resin, though in

a less degree, it has been employed in medicine, and used as an ingredient in decoctions, which were, at one time, much celebrated in several diseases of the system, particularly in Syphilitic affections. In yields in its efficacy to the Extract or Gum. The Gum Guaiac is obtained by wounding the bark of the above tree, from which it exudes in a considerable degree, and when a sufficient quantity has been discharged and hardened by exposure to the sun, it is gathered and packed in small kegs for exportation. It is of a greenish brown colour, is easily pulverized, and the powder which is at first grey, becomes green on exposure to air and light. Of the precise nature of this article chemists are not agreed, possessing as it does properties, allied to both gums and resins, and yet distinct from either.

*Medicinal Properties of the Gum Guaiac or Extract.*—It is a warm stimulant, generally diaphoretic, but sometimes diuretic or purgative. It excites the action of the heart and arteries, increases the heat of the body, and promotes the serous secretion, particularly that of the skin.

The Guaiac was originally introduced into Europe, from its supposed efficacy in curing Lues Venerea. For some time it continued to be employed as the chief remedy, and it is difficult to reject the testimony of its efficacy in curing these complaints. It has however declined in importance, since the use and proper administration of Mercurius came to be known. But though this article has been superseded by the more valuable article Mercury, in the treatment of Syphilis, yet, in what is called the sequelæ of the disease, it will be found very useful. Mr. Pearson, who was surgeon general to the Locke Hospital, where there are sometimes three thousand patients labouring under Syphilis, has given it a fair trial, and declares it to be incapable of curing the disease in its first stages, but says in cases where the strength is impaired by a mercurial course—where the membranes remain thickened, or foul indolent ulcers still exist, these symptoms will often yield to the decoction of Guaiacum.

The efficacy of Guaiac in Rheumatism; has been long and deservedly celebrated. Given in the chronic stage, after previous proper depletion, where there is but little fever, the pains frequently shifting their situation, with swellings of the joints, either the tincture or powder will be found very useful. But to produce its good effects it should be given in large doses, and I may add, that if it has lost reputation, it is in consequence of its having been administered in too small doses.

The usual dose, a tea-spoonful, is wholly inefficient, and instead of this quantity  $\text{ʒii.}$  to  $\text{ʒss.}$  may be properly substituted, following up its operation with wine whey or other diaphoretics. The utility of medicinal combinations is illustrated in the application



of this article to diseases, and the following formula will be found much more efficient than the simple substance.

R. Gum Guaiac,     ℥i.  
       Tart. Antimony, g.  $\frac{1}{8}$   
       Gum Op.         g.  $\frac{1}{2}$  m. for a powder.

To be repeated as often as the case requires.

Calomel is sometimes added with great advantage. By this combination, we obtain a new and more certain remedy, not afforded by the simple substance, for while the diaphoretic action of the Guaiac is promoted by a union with the other substances, pain and irritation are relieved.

The Tincture of Guaiac combined with a small quantity of Laudanum, I have found afford much relief to the pains that succeeded the Dengue Fever.

Of the utility of Guaiac in Gout, I can say nothing from my own experience, and I doubt whether it is at all adapted to the disease—and if employed, can only be resorted to during the intervals of the paroxysms.

Guaiac is much employed as an Emmenagogue, I shall speak of this application under that head.

In cutaneous diseases this article has been employed, and from its known tendency to pass off by the pores of the skin, it may doubtless be given with considerable success. In many of these cases, when they assume a chronic form, and when the constitution is enfeebled and deteriorated, the general excitement produced by this article, and particularly in the cutaneous vessels, has a considerable tendency to remove the disease, and restore the enfeebled system.

Combined in the manner I shall mention, I can declare from my experience, the very great efficacy which it possesses, in common with others, of removing cutaneous diseases, which had resisted the purgative and diaphoretic plans of treatment. Mr. Pearson also adds his testimony to its utility in these cases, and recommends it in combination with sulphur, antimony, &c., as an excellent remedy in Herpes, Scabies, Porrigo.

*Preparations of Guaiac.*—It is exhibited in the form of decoction of the wood, in diseases connected with Syphilis, and in cutaneous affections.

Of the manner of preparing this decoction I shall state hereafter. The decoction is taken in the quantity from a pint to a quart daily. It is also given in the form of tincture and powder.

Of the tincture from ℥ii. to ℥ss. Of the powder x. gs. to ʒss. three times a day. The tinctures are made by infusing the resin in diluted alcohol, and the Volatile Tincture, by adding a portion of the Aq. Ammonia to the simple tincture. This preparation is decidedly preferable.

*Family Thymelææ—Daphne Mezereum.*—This is a shrub which grows in the northern parts of Europe, and in the high and woody parts of France and Spain. The bark of the root is chiefly employed, the woody part being inert. It contains a matter acrid to the taste, and of an aromatic odour, which, applied to the skin, readily excites a blister, and a considerable discharge of serum.

Its properties are those of a stimulating diaphoretic, and occasionally diuretic and purgative.

On account of its agreeing in many respects with the Guaiacum, it has been employed in the same diseases, and often in combination with it, particularly in Syphilis, and various cutaneous diseases. It is not trusted to alone, in these cases, but is used in combination with other alteratives. It may be used in the form of simple decoction, but chiefly as an ingredient in compound decoctions, or in powder, in doses of ten grains, three times a day, in jelly or milk.

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*Family Asparagineæ—Smilax Sarsaparilla.*—This is a plant which grows in the West Indies, and in South America, and is found in some parts of the United States. It is brought to us in long slender roots, of a brown colour externally, and white within, being covered with a thin coat, and having a wrinkled appearance. It is without smell, and when chewed has a mucilaginous and slightly bitter taste. Its active principles are extracted completely by boiling water.

Sarsaparilla has been considered diaphoretic, alterative, and sub-tonic, and for these purposes may be considered a valuable medicine.

It was brought into Europe as late as the year 1530, with the character of being a specific for the lues venerea, in which disease, it had been employed by the Indians with considerable success. It, however, lost credit upon the discovery of the superior efficacy of Mercury, and, as is usual its virtues were overlooked. It was again brought into notice by Dr. Wm. Hunter, and Sir George Baker, both of which gentlemen, have, with considerable accuracy, discriminated the forms of disease to which it is best adapted. Dr. Wm. Hunter was induced to make trial of it, in a bad case of Phagedænic bubo, and the benefit obtained, in this instance, led him to extend the application of the medicine.

In proceeding to speak of this article, I would observe, that the remarks made will not have reference to the sarsaparilla alone, but they must be understood as applying to it, in its various states of combination. By itself it is highly useful, but the good effects derived from this and other similar articles, as the guaiacum, mezereon, sassafras, &c., are greatly increased by combination

with each other. It is therefore of the combinations of this article, contributing as they do to their increased activity, as well as to the greater convenience of administration, that the practical remarks I shall make will apply.

Sarsaparilla and its combinations are admirably adapted to the secondary stages of Syphilis. The secondary forms of this disease exhibit themselves in the most painful, loathesome, and mortifying affections of the human body.

Originating as these diseases do, not in single acts of folly, or the weakness to which human nature is subjected, but in a continuance of excesses, dissipation and disease, the subject of secondary syphilis, exhibits most frequently in constitution and appearances, a body impaired in its energies, and crippled in its faculties.

Mercury alone, in a constitution like the one I have described, cannot be endured. Its stimulating or rather irritating operation, under these circumstances, aggravates all the symptoms, harasses the patient, and superinduces the most distressing consequences. Sarsaparilla and the vegetable alteratives, combined with very minute quantities of the perchloride of mercury, in the manner I shall point out, forms a preparation freed from the objections just made, and a medicine well adapted to the disordered states of the constitution now under consideration.

It will be found excellent in restoring the appetite, strength and flesh of the patient.

It will complete the cure of ulcerations of the palate, throat and mucous membrane of the nose, skin and other parts.

It will remove nocturnal pains of the limbs, painful enlargement of the joints, of the bones, membranous nodes, cutaneous ulcerations.

It will efface the blotches, foul spots, stains, &c. which, in a constitution of this character, so frequently occur, from slight irritations, or which remain after the ulcerations have healed.

It will remove that morbid condition of the solids and fluids, which disposes every injury, however slight, to degenerate into a festering, painful, scabby ulcer.

It will, in short, so improve the digestive and assimilating operations of the system, that a more healthy blood, and more renewed fibre will be substituted, for the defective conditions of the one and the other, and thus fully support the character bestowed on these medicines, of being essentially alterative. To accomplish these objects, this class of medicines must frequently be long and perseveringly employed. It cannot be supposed that these great and important designs can be effected by a few, or lengthened repetitions of these substances. To their continual use it will occasionally happen, that other alteratives be added, as diet, change of climate, a long sea voyage, travelling.



Sarsaparilla and its combinations, will be found useful not only in what is called syphilitic rheumatism, but in the chronic forms of ordinary rheumatism.

It will be found useful in various affections of the skin, as in the pustular, papillary, and herpetic. Under the last, I would consider not only the affections, properly so called, but that very troublesome disease *Tinea Capitis*, which, when long existing, refuses to yield to local remedies, and requires the aid of such as are constitutional.

The combinations of which I am speaking, will be found useful in the chronic ulcerations, of such frequent occurrence in the labouring and poorer classes of society. The tonic and alterative impressions excited, contribute to the rapid and successful operation of granulation and cicatrization.

From the remarks I have made upon these articles, you will be convinced that I repose no small confidence in their virtues, and with the opportunities I have had of prescribing them, in constitutions impaired and debilitated, from diseases and excesses of various kinds, in habits vitiated from a scrofulous or venereal taint, or from the injudicious use of mercury, the relief, which, in many instances, has been afforded, fully entitles them to these commendations. I might say more, but I shall probably be charged with extravagance. I have said sufficient to direct your attention to their virtues and efficacy.

*Preparations of this article.*—Sarsaparilla yields its virtues very readily to boiling water, but that the whole of its active and extractive matter be obtained, it is necessary that the boiling be continued a considerable time and in a close vessel.

The active matter is contained in the cortical part, and in nine cases out of ten, where the decoction is made, it is undissolved, and the roots taken out before the water is impregnated.

The preparations which are, or have been in vogue, are the simple decoction, the compound decoction, Syrups and Extracts.

The simple decoction is prepared by macerating  $\frac{3}{4}$  li. of the root in four pints of boiling water, for four hours, in a vessel lightly covered, and placed near the fire, then taking out the roots, bruising them, returning them again to the liquor, macerate in a similar manner for two hours more, and boil it down to two pints, and strain. Dose, 1 pint or more daily.

The compound decoctions are prepared by combining with the Sarsaparilla, other articles, as the shaving of the wood of Guaiac—bark of Sassafras—Liquorice root—bark of Mezereon root—water. This is the Lisbon diet drink, and for the proportions, and manner of preparing, I refer you to the dispensatories.

A preparation, superior to the Lisbon diet drink, is the following.

R. Sarsaparilla,	℥viii.
China Briar Root,	℥viii.
Sulphuret of Antimony,	℥viii.
Gum Guaiac,	℥iiss.
Water,	xxiv. ℔s.

These ingredients are to be simmered in a close vessel for 12 hours, the steam being prevented from escaping. After simmering the time prescribed, to be strained, bottled, and kept in a cool place. The Antimony is to be coarsely powdered, enclosed in a piece of linen rag, and suspended from the cover of the vessel. In using this preparation, I have no other limit than the quantity the stomach will bear. I have known a quart taken daily, and its use must be continued for weeks or months.

These preparations though valuable, will not be persisted in by the patient for any length of time. From the delicacy of the stomach, or the captiousness of the invalid, large and repeated draughts of these medicines will not be taken.

That the remedies may be persisted in, it becomes necessary to present it in a more agreeable form. This is done by increasing the quantities of the ingredients, continuing the decoction longer, forming a fluid extract, and combining sugar and treacle so as to form a syrup.

The first preparation introduced into general notice under this head, was that prepared by Swaim, and called Swaim's Panacea. There can be no doubt that it is a preparation of sarsaparilla, with other of the vegetable alteratives reduced to a concentrated state by boiling. When thus reduced, sugar or treacle is added, and a syrup formed. In this preparation some progress has been made, and to the vegetable, the mineral alteratives have been added. The mercurial preparation used, is the Perchloride of Mercury or Corrosive Sublimate. This article may have been selected from its activity, the smallness of the quantity required, the difficulty of detection, and its seldom salivating.

The union of these articles, has placed us in possession of a preparation, more active, more agreeable to the taste, and more convenient for administration.

The following is the formula, which I have for some time past employed, and would confidently recommend to your attention.

R. Sarsaparilla Root, cut fine,	℔ss.
Stylingia Root, or Queen's Delight,	℥iv.
Shavings of Guaiac wood,	℔ss.
Sassafras Root,	℥iv.
Water,	1 gallon.

Boil for 6 or 8 hours, or for a sufficient length of time, to extract the virtues of the articles—Water must therefore be added as it evaporates, and it may finally be reduced to two quarts. To this,

sugar or molasses is added, and the whole simmered to the consistence of a syrup. To each pint of this syrup, two grains of Corrosive Sublimate is to be added, previously dissolved in spirits.

The dose will vary, for an adult from  $\text{ʒss.}$  to  $\text{ʒi.}$  three or four times a day. For children less.

Further experience in the preparation of the Syrup, induces me to recommend that the Sassafras root, and the shavings of Guaiac, be added to the decoction, towards the close of the boiling—and the Stylingia or Queen's Delight, added in the form of a saturated tincture to the Syrup, in the proportion of a pint to the gallon.

Thus prepared it is by no means unpleasant, and I have tested its good effects in nearly all the diseases I have enumerated, in which Sarsaparilla is useful.

The last of the preparations of this article is the extract. This is obtained, as watery extracts usually are, by long boiling of the roots, and evaporating. This preparation is liable to the objections which have been made to these substances, viz. inertness, from the injury sustained in the process.

Mr. Carpenter has prepared a fluid extract, freed from these objections in a considerable degree.

By the agency of steam, he has been able to concentrate, in a very great degree, the active matter of Sarsaparilla, and furnishes a very neat and useful preparation. Two table-spoonsful added to 15 ounces of water, or simple syrup, gives a mixture equal in strength to a pint of the ordinary decoction, or the Lisbon diet drink.

Two grains of Corrosive Sublimate, dissolved in a small portion of alcohol or water, may be added, in small proportions, to the syrup or simple fluid.

Compound fluid extract is an extract from Sarsaparilla, Guaiacum, Mezereon, Liquorice, Sassafras, and so concentrated that two table-spoonsful are fully equal to a pint of the decoction.

Sarsaparilla is administered, combined with mineral waters. A Syrup of Sarsaparilla is prepared, and a portion of it is added to the Soda Water obtained at the artificial mineral fount.

An alkaline principle has been obtained from this root, to which the term Parillina, or Sarsaparilline, has been given. It has not been applied to any practical purpose.

In selecting the roots, it will be right to choose such as are plump, not carous, or too dusty on breaking, and which split easily longitudinally.

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*Substitutes for the Sarsaparilla.*—There are several articles growing in our state, so nearly resembling the imported, as to be advantageously substituted for it—one of these is the



*Smilax Herbacea*.—Root perennial.  
 Stem herbaceous, 2 to 4 feet high.  
 Leaves oval or ovate, 5 to 7 nerved.  
 Flowers on the lower part of the stem.  
 Berry, spherical, black, 2 to 3 seeded.

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*Smilax Pseudo China*, or *China Briar*.—Is another substitute, and is very commonly met with.

*Characters*.—The root is tuberos and creeping.

Stem, climbing over small shrubs.

Leaves as in most of the genus, semi-perennial, many of them adhering to the stem during the winter. The lower leaves cordate.

Berries black.

The root cut into small pieces, is much employed in decoctions and diet drinks. It is possessed of some acrid properties, and on this account it often acts as an emetic when the decoction is too strong. I have employed it very frequently, but should give a decided preference to the imported article.

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*Ulmus Fulva*—*Slippery Elm*.—The bark of the tree and branches employed

The good effects of this bark have been much extolled by Dr. Lettsome and other writers. It has been employed very extensively in Public Institutions, and its virtues spoken of in high terms.

The following is the mode of administering it.

To a decoction of the Elm Bark, add

R. Sassafras Root,	ʒi.
Shaving of Guaiac wood,	ʒi.
Mezereon root,	ʒiii.
Liquorice Root,	ʒi.

These are to be boiled together an hour and strained.

The decoction when properly prepared is of a clear brown colour, not unpleasant to the taste, and contains a considerable proportion of amylaceous and mucilaginous matter.

Administered in the quantity of a pint a day, it appears to increase the insensible perspiration, to restore the appetite, improve the tone and powers of the digestive organs, and to strengthen and invigorate the general system.

For its mucilaginous properties it is employed in the form of a tea or drink, in affections of the bowels and bladder. The bark when dried is also used for dilating sinus's and contractions of the urethra, &c.

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With these articles I complete the consideration of the Stimulating Diaphoretics, and proceed to the second division. Those

which produce relaxation by diminishing action, and at the head of them I shall place the *Antimonial Preparations*.

Of the preparations of Antimony, which, at different times, have been celebrated for their several virtues, it is not necessary to speak in detail—they have either been condemned for their harshness or their inertness, and in their place there remains a few, which combine the properties of the class, and under judicious management, become active and efficient medicines.

They are the Tartarized Antimony, the Antimonial Powder, and others.

Of the Preparation of the Tartarized Antimony I have already spoken, and also of its emetic properties.

It appears also to promote the excretions, and to quicken and stimulate the action of the absorbent vessels. It is eminently diaphoretic, sometimes expectorant and often diuretic.

It may be made to produce these effects, by varying the dose, increasing it to render it a vigorous emetic and cathartic, and diminishing it, when the more gradual operation of a diaphoretic and expectorant is to be secured.

The diaphoretic action of Tartarized Antimony, has been commonly supposed to be connected with the production of nausea, by which a reduction of arterial action ensues, and a relaxation of the vessels of the surface takes place.

Dr. Cullen is evidently of this opinion, when he says, "that this medicine, operating as it always does, more or less, upon the stomach, by that operation excites the action of the extreme vessels." All emetic substances are capable of exciting perspiration, when given in nauseating doses, and very great relaxation exists under such circumstances. The vessels of the skin are greatly relaxed under this feeling, and a free perspiration is often the consequence. Antimony, however, would appear to exert a direct and specific operation upon the skin, for a long continued course of Antimonials, of the mildest form, wherein the direct operation of this metal is scarcely at any one time to be detected, has been found of essential service, in obstinate cutaneous complaints.

Besides this property of exciting perspiration, it is possessed of others, upon which its good effects in diseases essentially depend. These are its sedative and febrifuge powers, which it exerts, independently of its nauseating impression upon the stomach, and this we infer from its subduing arterial action, and lessening pain, without any sensible evacuation following its administration. Such being its effects, its importance in inflammatory diseases may well be conceived, and accordingly, since its introduction into practice, there has ever been a number of advocates in its favour.

It has been employed in the Bilious fevers of our country, in combination with the Nitrate of Potash, and its good effects have

been extolled by Dr. Rush. After proper depletion, it constitutes one of the most valuable diaphoretics we possess.

The combination, in the following proportions, constitutes the Antimonial powders.

R. Nitrate of Potash, g. x.

Tartarized Antimony, 1-6 or 1-8 of a grain.

Made into a powder, and repeated every two or three hours.

The usual dose of Tartarized Antimony, as a diaphoretic, is the 1-6 of a grain.

The next of the Antimonial preparations is the *Pulvis Antimonialis*. It is prepared by calcining together, equal weights of hartshorn shavings, and sulphuret of antimony, until the mixture becomes of a white colour, forming a protoxyde of antimony with phosphate of lime.

This preparation, Mr. Pearson considers, possesses the same chemical properties as the formerly celebrated James' powders.

The antimonial powder, is undoubtedly a very useful and efficacious diaphoretic, and is employed with advantage in the Remittent and Inflammatory fevers of our country. I have employed it very frequently, and am decidedly favorable to it as a diaphoretic preparation.

I would observe, that it is frequently an inert article, from carelessness in the preparation. Its inertness is owing to the following circumstances:

1. To the Peroxide of Antimony being formed, instead of the Protoxide. The Peroxide is comparatively inert, requiring to be given in large doses, to produce the same effects which result from small doses of the Protoxide.

2. In the second place, it may contain a large portion of the Phosphate of Lime, combined with it, which also is an inert article.

Hence, therefore, the effects, as well as the composition of this article, will often be found very variable.

That it is very variable in its effects, arising from the imperfect preparation, I would state, that I have given it in doses of 5 grains to 3i. Beginning with small doses, the quantity has been gradually increased to 60 grains, without any sensible effect, and this result has followed, not from any particular parcel, but from several, obtained from different apothecaries. These remarks are not made to depreciate the article, but to place you on your guard in the employment of it.

I shall therefore pass cursorily over it, as there are no particular indications to be fulfilled by it, apart from the usual antimonial preparations. I would even recommend, as a substitute for it, the Tartarized Antimony, administered in the following manner:



R. Tartarized Antimony, gr. viii.

Powdered Gum Arabic.

Powdered Liquorice Root a ʒi. m.

16 grains of this powder, contain one grain Tartarized Antimony, so that from 2 to 4 grains, will be the average dose, for the fulfilment of those indications, which are generally expected from 4 to 8 grains of the common antimonial powder.

The dose of the Pulvis Antimonialis, as a diaphoretic, is from 3 to 4 grains, every 2 hours.

In administering the antimonials, it will be advisable to give them often and in small quantities, for it is of importance to keep up the action of medicines, and to none does this apply more forcibly, than to the diaphoretics.

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The next of the Antimonial Preparations is the *Kermes Mineral and Golden Sulphuret of Antimony*.

The preparation of these articles has already been detailed. They are of more uniform strength and of greater activity than the preceding. The Golden Sulphuret, is of a lighter colour than the Kermes, the latter being generally a brown or brick red.

They are much resorted to by some physicians, particularly the French, for their diaphoretic operation, and are employed in all those cases in which this class of medicines has been recommended. You will frequently find them very beneficial, and they are given in doses of from 2 to 5 grains.

In obstinate Catarrhal affections, I have derived much benefit from their use, after the more active symptoms have been reduced. Either of them is very conveniently given, rubbed up with simple syrup, in the proportion of ʒss. or ʒii. to ʒvi. or ʒvii. of mucilage or syrup. ʒss. to be taken frequently.

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*Ipechacuanha*.—Of the natural history of this article I have already treated,—as also of the chemical researches of Messrs. Pelletier, and Magendie, and of its emetic properties. That it is a diaphoretic there is no doubt, but this seems to depend entirely upon the influence which it exerts upon the stomach, producing nausea, with a reduction of arterial action, and a relaxation of the surface. It is not to be compared in these respects to the antimonial preparations. As a diaphoretic it is rarely given alone, but in combination with opium and sulphate of potash, forming the Dover's Powder. Of the value of this combination I have already spoken, and will only add to what was said upon this subject, its great utility in deranged conditions of the alimentary canal in children, proceeding either from teething, or the interruption of the cutaneous secretion. In the cases to which I allude, there is commonly not much fever, but the child is restless, loathes food, some-

times rejects what is taken, and is debilitated by a frequent discharge of thin watery stools. In some cases I have known a dozen to occur in the course of the day, unattended with much feculent matter, and appearing to be little more than serum, with a very offensive odour. The treatment of these cases, by the administration of the Dover's powder, in such doses, as are adapted to the age, will be attended with the happiest effects. I have commonly combined it with the prepared Chalk, in the following proportions.

R. Dover's Powder, gr. iv.

Prepared Chalk, gr. xii. mix and divide into vj. powders, one to be taken every 3 or 6 hours.

Were I to select an instance of the positively beneficial effects of medicine, it would be the employment of the Dover's powder in these cases. I have known the complaint, after a continuance for days, and in one or two instances weeks, to be speedily checked, and health restored by a few doses of this medicine.

Ipecacuanha, in small doses, often repeated, may be prescribed with advantage in Catarrhal affections, and in obstinate diarrhæa. The efficacy of this article, in these cases, is supported by the special action which emetine, in the experiments of Messrs. Pelletier, and Magendie, appears to have on the lungs, and alimentary canal.

In dysentery, its beneficial effects are equally conspicuous, in small doses, and there are few practioners who have not availed themselves of this article, in these cases. By the physicians of India, it is highly extolled, in the peculiarly malignant and destructive complaints of that country, but in doses of ℥i. or ℥ii. combined with one or two grains of opium; and the efficacy of this treatment, in arresting vomiting, diminishing the painful tenesmus, and inducing perspiration is highly extolled.

The dose of Ipecacuanha, as a diaphoretic, is grain ss. to ii. grains, every 2 hours.

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*Nitrate of Potash or Nitre.*—This is a species of salt, which in Persia, and the East Indies, is extracted from native earths. It is found in immense quantities in Bengal. The tendency of the soil to produce it, is such, as to be exceedingly annoying to the builders and occupants of houses. It can scarcely be prevented from encroaching, in a few years, on the walls and floors of the lower rooms, so as to render them unwholesome, and eventually uninhabitable. Half of the houses in Calcutta are in this predicament.  
—*Heber.*

It is likewise produced artificially in several parts of Hungary, Germany, and especially in France, by making nitre beds of putrifying animal and vegetable substances, which after fermenting

for a year or two, are lixiviated, and the solution evaporated to crystallization.

*Properties.*—Nitre is of a sharp, bitterish, pungent taste, followed by a sensation of coldness. When pure, it dissolves in about six times its weight of water, and on evaporating, concretes in transparent crystals. It is much used in medicine, both in fevers and in inflammatory affections as a diaphoretic, but it seems to be principally useful for its refrigerant and somewhat sedative qualities, in allaying the action of the arterial system, and diminishing heat and thirst. It is therefore a very valuable medicine in diseases attended with high vascular excitement.

To increase its powers it is usually combined with Tartar Emetic and Calomel, forming the Nitrous powders so well known. By combination, its diaphoretic action is much increased, and in fevers, attended with biliary derangement, calomel will be found a very good corrective, while it promotes the alvine discharges. In every respect, therefore, this combination will be found deserving the very high encomiums bestowed upon it, fulfilling as it does most of the indications in fever. The following is the formula, which may be used on these occasions.

R. Nitrate of Potash, ʒiiss.

Tartarized Antimony, gr. i.

Calomel, gr. viii.—m. and divide into viii. or ix. powders, one of which is given every 2 or 3 hours.

Nitre when taken in large doses, excites very painful and distressing symptoms. I attended a patient, who, by accident, took an ounce of this salt for Glauber Salt. The effects produced upon being swallowed were severe spasmodic contractions of the stomach, attended with violent pain and vomiting, by which, fortunately, much of the solution was rejected,—colicky pains, bloody stools, tenesmus.

The treatment which had been pursued was the administration of a cathartic, which had operated actively, but many of the symptoms still continued. Under these circumstances anodynes were prescribed, and in a few hours with entire relief. The usual dose is 10 or 15 grains.

Nitrate of Potash has occasionally been mistaken for the Sulphate of Soda, or Glauber Salts. This might occur from the similarity of their crystals.

They may be distinguished; one contains a good deal of the water of crystallization, and the other does not.

There are other articles, the crystals of which are much alike. The Sulphate of Zinc—Sulphate of Magnesia, and Oxalic Acid. They are so much alike, that they have been mistaken for each other. As very serious effects would arise, from a dose of one of



these substances being taken for the other. It is proper, therefore, that with respect to them, you should be placed on your guard.

The crystals of the Sulphate of Zinc, are not readily distinguishable from those of the Sulphate of Magnesia, and the resemblance which the crystals of Oxalic Acid bear to those of Epsom Salts, has caused fatal consequences in many cases. The acid is a very corrosive poison. Antidotes to Oxalic Acid—Lime—Magnesia—whereby is formed an insoluble oxalate of lime.

*Carbonate of Soda.*—It has a saline and slightly alkaline taste, and is chiefly employed in the form of a saturated solution with Citric Acid or Vinegar. The preparation is as follows.

Take of Lime Juice or Vinegar, ℥ii.

Carbonate of Soda, as much as may be sufficient to saturate it, previously dissolving it in a little water.

Sugar, ℥ii.

Water, ℥ii.—℥ss. every hour or two.

This preparation is adapted to the febrile affections of children, and even to grown persons of delicate habits. It is called the saline or neutral mixture, and may be taken in its simple state, or combined with Antimonial Wine, or Sweet Spirits of Nitre.

Or the Carbonate of Potash, may be taken in the form of the effervescing draught.

It is prepared in the following manner.

Carbonate of Potash or Soda, ℥ss. to ℥ii. dissolved in half a wine glass of water. To this is added Lime Juice or Vinegar, as much as is necessary to saturate the alkali.

Upon the addition of the acid, considerable effervescence takes place, occasioned by the escape of the carbonic acid gas. In this state it is drunk, and is much recommended in irritable states of the stomach—in checking vomiting, and exciting perspiration. The dose may be repeated every 2 or 3 hours.

#### UPON THE EXTERNAL MEANS OF EXCITING DIAPHORESIS.

In entering upon the consideration of the means which are to be employed, in placing the surface of the body in a state favorable to the secretion of perspiration, its various conditions must guide and direct us in the choice of the agent.

These conditions, as they admit of considerable variations, so do the means with which we operate in order to accomplish our purpose. The skin, in many instances, will be found in a highly excited state, corresponding with the general condition of the arterial system. While this exists, the perspiration is suspended, either from the constriction which is formed, or from what Dr. Rush would attribute to the excitement, transcending the point of

secretion. To promote the discharge under these circumstances, cool air and cold applications, are best adapted.

In other cases, particularly in chronic affections, and the feeble action of the vital powers, the skin is in an opposite condition; it is cold and dry, its functions are but feebly performed, and hence, being deprived of that moisture, which gives to it softness and delicacy, it is contracted, hard, and communicates to the touch a feeling not unlike that of parchment. Applications, opposite those of the preceding, are required to renew the secretion and warmth in the several states of vapour, heated air and warm applications become necessary. Hence a division is established, and the means which are employed are arranged under one or other of these classes.

The mode in which the increased state of excitement is reduced being either by bathing in cold water, or by its affusion or aspersion. I shall commence with the consideration of the *Cold Bath*. From ancient history we learn that bathing was held in great estimation, even at periods when mankind had advanced but little in the scale of civilization, for its healthy operation upon the system, and for preserving the skin in a state favorable to the proper exercise of its functions. The agreeable influence, which it exercises, caused it afterwards to be resorted to as an article of luxury, and the splendid edifices erected for this purpose by the Romans, with their costly appendages, calculated either to please the senses, or promote the salutary influence of the bath, too well inform us of the high value which was placed upon them. They, in short, were made a part of the daily regimen.

Immersion in water at a considerable degree below the animal temperature, is an agent capable of producing very powerful effects upon the whole system, on account of the extent of sentient surface to which it is applied, and for this reason as a remedial agent, it may be regarded as of primary importance.

When a person, therefore, in a state of health, or labouring under disease, is immersed in water of the temperature of about 65° of Fahrenheit, the following occurrences are observed to take place. There is experienced a sudden sensation of cold, forming that shock to the whole system, which is one of the most important effects of the cold bath; at the same time there takes place a reduction of the morbid heat of the surface of the body. These are succeeded by a sense of warmth, which increases rapidly to a certain extent, constituting what has been termed a glow upon the surface. It is a re-action which Dr. Brown considers as arising from an accumulation of excitability, and to result from the actions of the vessels of the skin having been suspended. However produced, it seems to be a peculiar effect of the living power, and to be excited in a degree proportionate to the force of that power,

and to the intensity of the cause which called it into action. It is therefore greater in persons whose constitutions have been but little impaired, and according to the degree of coldness of the water. The consequence of this re-action, is an increase of the production of animal heat, and a sudden effort within the body and the whole arterial system, to overcome the impression which has been made upon the surface. It is easy therefore to perceive, that when the body has been placed under such circumstances for a few seconds, a considerable impression must be made upon the nervous system, and secondly upon the sanguiferous and absorbent systems, and that such an impression may be made subservient to the relief of various diseases.

The diseases and morbid symptoms for which the cold bath, under one form or another, may be applied with advantage, are very numerous, and some of them deserve particular attention. One of the most important of its uses is in the hot stage of fever, and under proper management, it forms a highly valuable remedy. The evolution of an uncommon quantity of heat, and a temperature several degrees above the natural standard, attended with a dry unspirable state of the skin and extreme vessels, are characteristic of this stage of the disease, and these symptoms are more or less accompanied with a hurried, unsteady pulse, and a wandering of the thoughts, or complete delirium. Whatever be the proximate cause of fever, the most obvious and most urgent indication is to get rid of this excess of heat, which constantly aggravates all the other morbid symptoms, and which nature is not at that time able to effect, by the cooling process of increased perspiration. By whatever means this process could be brought on, the end of cooling the body would be answered.

In fever the morbid state of the extreme vessels is difficult to be overcome, except by the actual application to the skin of a cold medium, whose power of conducting heat is considerable. We possess several methods of performing this salutary operation, which act with different degrees of energy. Cool air, the free circulation of which is always aimed at, in the present mode of treating acute fever, we may consider as the lowest in the degree of conducting power, and yet the effects arising from this simple application, are highly sensible and salutary. Air when at rest is known to be a very bad conductor of heat, and therefore its circulation through the chamber and around the body of the patient, is to be particularly attended to. A more powerful method of cooling the body, is that of washing the skin, or every part successively, with cold water or cold vinegar, and as this operation always admits the play of air upon the feverish body, the speedy evaporation thus produced, forms a cooling process that acts with great energy.



This, however, yields in force, to the bold and vigorous practice which has occasionally been adopted, of plunging the whole body in cold water, or what amounts to the same, and is of more convenient application, that of dashing a sufficient quantity of water on the naked body. This custom, which is a common remedy in hot climates, and has been practised by a daring and often successful empiricism among several uncultivated nations, who follow only the dictates of nature, has been lately recommended to the world under such judicious directions, as to be made a remedy, capable of being adopted to a very great extent, and with nearly as much safety as confidence.

To give safety to the employment of the bath, the directions which Dr. Currie has so minutely detailed, should be attended to. The most advantageous time for using the affusion, or bath of cold water, is when the exacerbation is at its height, or immediately after its declination has begun; but it may be safely used at any time of the day, when there is no sense of chillness present, when the heat of the surface is steadily above what is natural, and where there is no general or profuse sensible perspiration.

These directions are of great importance, and if attended to, we need never feel any apprehensions of the bath proving injurious. The most salutary consequences which follow the proper use of this powerful remedy, is the production of profuse and general perspiration, and this is the result partly of the sudden reduction of animal heat to its natural standard, but principally of the great reduction produced throughout the whole of the circulating system, by means of the violence of the shock. It is this circumstance that appears to give so much advantage to a general affusion of cold water in fevers, in preference to any partial application.

The application of cold in any way to the skin, during the hot stage, whilst it diminishes the animal temperature, takes off the parching thirst, lessens the frequency and hurried beat of the pulse, and renders it slow, full and regular. It likewise removes that restlessness and wandering of ideas, which precede a complete delirium, and occasions a sound and easy sleep.

Various instances are to be found in the records of medicine, of persons, who, under the delirium of fever, have thrown themselves into cold water, in almost all of which it is mentioned, as very extraordinary, that the patients when taken up were perfectly in their senses, and speedily recovered from their disorder. Of these cases a great number have occurred at sea, where it is evident accidents of this kind are most likely to happen.

From what has been said, the explanation is very easy, and the remedy may be considered a very natural one. In acute fever, therefore, the object of the cold bath is to lessen the heat of the

body, to bring on universal perspiration, to diminish action in the circulating system, and thereby to occasion a state of repose of body and mind, and sound sleep. These objects are fully accomplished in the hot stages of yellow fever—of the bilious remittent or country fever—of intermittents—of simple continued fevers, &c., in all of which I have employed the bath with the most gratifying effects.

In yellow fever, it is my constant practice to immerse the patient, during the excited states of the system, in a cold bath, or, what is better, seating him in a large tub, and dashing the water over the head and shoulders, or pouring it from a height upon the head. This is continued for 5 or 10 minutes, the patient is wiped, not very carefully, and allowed to lie down. I am not very anxious to cover him up with bed clothes, to excite perspiration in this manner. The advantages derived are, a reduction of morbid heat, a diminution of arterial action, and the removal of the distressing effects which depend upon it, as head ache and delirium, irritable stomach, pains in various parts of the body.

The same practice is pursued in country fevers as they are called, and with the same result. You are not to rest satisfied with a single affusion of the water, or to expect that the paroxysm will not be renewed. This will take place, and the symptoms will all again recur, though with less severity. The same practice must again be resorted to, and the same effects will follow, and it must be persevered in whenever the excitement calls for it. Employing at the same time the medicinal treatment that the case requires, I have had the satisfaction of restoring all that were subjected to this practice.

The same course may be resorted to, with great advantage, when these fevers attack young persons, and I have known the relief afforded so marked, that, though at first opposed to the bath, they submit afterwards readily to its operation, and even call for it. I cannot, therefore, in these cases, urge the practice upon you with too much confidence, satisfied that it is calculated to fulfil every object, which this state of the system so loudly demands.

To the precautions which I have already given, it must be added, that the bath is inadmissible in fevers attended with local inflammatory affections, as when they are complicated with pneumonic inflammation, or in the eruptive fever, which precedes measles, scarlatina, and some other eruptions.

It may be proper to state, that the period for using the cold bath should not be the very first paroxysm of fever; but that after depleting remedies have been employed without diminishing the action of the system—that when from their continuance they threaten dangerous consequences, or are not likely to yield to ordinary modes of treatment, then the bath is to be resorted to. Hence,

therefore, every case of fever would not require it, for in the major part of them, our usual remedies are capable of making an impression. It is only in the more inveterate forms, such as by their violence threaten disorganization, or the derangement of parts upon which they fall, that the more powerful remedies must be brought to our assistance. Used with the precaution I have mentioned, the cold bath is perfectly safe, and will be found efficacious in subduing excitement for a time.

When the paroxysm returns, or the excitement is renewed, it is again to be resorted to, but in the mean time such remedies as the case requires are to be pursued, and our forces thus combined will often be successful, and that speedily.

One of the advantages of the bath is, that it does not interfere with any plan of treatment, and in many instances it will promote the operation of other means. The common impression that cold applications and cold drinks are inadmissible, during the use of mercury, is highly erroneous, and where this medicine is employed with a view to excite ptyalism in fevers, the bath will be found an excellent adjuvant. It lowers and subdues action, and so far renders the system more susceptible of the mercurial impression.

In treating of the *Materia Medica*, I can only speak of the remedies separately, and of the properties which characterize them. It is not, however, by the power of any single agent, that we can expect to subdue disease, but it is from the joint action of all that can be brought to bear, that we are to derive full effect. It is not by blood-letting or emetics, by purgatives, diaphoretics, or the cold bath alone, that we can accomplish our purpose, but from each and all of them being applied judiciously, at a proper time, and in their proper places.

I would gladly extend the consideration of the cold bath to other diseases, in which its cooling operation is not the object in view, as in the treatment of various chronic diseases, in which its tonic action is required, but I shall be overstepping my boundaries, and will proceed to the other means of exciting perspiration.

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*Of the Tepid and Warm Bath.*—These terms are applied to water ranging from 85, 96 and 98° of Fahrenheit. Baths of this description, will be followed by sensations differing from the preceding—but will be found efficacious as a remedy in diseases.

“They are applicable to all the diseases to which the cold affusion is applied, and are preferred, when there is any doubt of the strength being sufficient to react, after a cold immersion. They possess very considerable efficacy, they are safe, easy of application, in a high degree grateful, and may be extended to most of the whole class of febrile diseases.”—*Clarke*.

The warm bath from its stimulating operation upon the vessels



of the skin, has a peculiar tendency to alleviate any local irritation. to remove morbid congestions in the circulating fluids, and therefore to be more peculiarly applicable to the advanced stages of fever, when, in addition to the impaired condition of the vital energies, there is added accumulation of fluids upon particular organs. For these purposes it is well adapted, and is employed very advantageously.

It is applicable to weak and irritable constitutions, which the shock produced by the cold immersion, would overpower, and which have not sufficient vigor of circulation for an adequate reaction. By the relaxation which it produces, perspiration is excited, and hence it is used with impunity in cases where the animal heat is already too high, for by relaxing the skin, the great cooling process of perspiration will more readily follow, and the general effect will be that of diminishing heat.

In this view, therefore, the operation of the warm bath to the dry hot skin of a person labouring under fever and general accumulation of heat, is in the end the same as that of the cold bath; that is, by inducing perspiration, it brings down the animal heat to the natural standard, and this method is often employed with success.

For its relaxing operation, the warm bath has been recommended in several spasmodic diseases.

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*Vapour Bath*,—The Vapour Bath in use in this country is simple in its construction, and is well calculated for its simplicity and efficacy, to bring into general use an agreeable and salutary practice, as well as a powerful remedy in many obstinate diseases. It consists of a chamber, into which the steam of boiling water, either simple or medicated, is conveyed through pipes, from a common digester or steam boiler. The patient is seated in a chair, and the vapour ascends through a perforated plate at the bottom, which soon envelopes the body and is taken into the lungs. In this apparatus the stimulant power of heat is modified and tempered by the moisture united with it. Its heating effect is farther diminished by the copious perspiration which ensues, so that on all accounts the vapour bath is a safe and effectual application.

The vapour bath may be applied to the whole body, or to any part of it—its immediate effects are to excite or increase the action of the heart and the superficial arteries, by which the determination of blood to the deeper part is diminished, this increase of circulation at the surface of the body, producing a copious perspiration, which may be continued, as it is excited, at pleasure.

The utility of this application is obvious in all cases of internal inflammation; it draws a great quantity of blood to the surface,

and relieves the internal parts by the secretion of the skin, which is the mode nature takes to relieve inflammation and fevers.

Besides an increased perspiration, other effects are produced on the system, equal and due action is restored to the surface, and a highly agreeable sensation produced.

The vapour bath I am disposed to consider a very valuable auxiliary, in several obstinate and severe forms of disease. Though unwilling to admit of the extensive application for which it has been extolled, I have no hesitation in stating, that in diseases which originate in suppressed perspiration, as rheumatism, and in increased discharges of the intestinal canal, in dropsy, in hepatic affections, and in cutaneous diseases, it will be found, in conjunction with other remedies, to be highly deserving of attention.

Of its utility in rheumatism I can speak with confidence, having seen several cases, which had resisted the internal administration of medicines, directed with care and judgment for years, yield to ten or twelve baths without any other medical treatment. The vapour bath seems to be peculiarly well adapted to such cases, since being so far removed from the centre of action, the stomach is too often debilitated by the use of antimonials without any benefit being afforded,—the bath, therefore, from the nature of its action, yields to no drug, excites a free perspiration, and in its operation preserves the system uninjured.

It is upon these principles that its good effects are to be explained; and I would recommend it in all cases as an auxiliary, and in many as sufficient, with proper evacuations, to effect a cure. In Dropsies it has also been employed advantageously.

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The *Sulphur Bath*, such as was described when treating of the article Sulphur, is another method of exciting perspiration. Baths of this nature are not usually resorted to with this view, but are highly valuable in the treatment of various cutaneous affections, in rheumatism, in other pains of the articulations, and in inveterate syphilitic cases, which have resisted other modes of treatment. Having, however, already spoken of the construction of the bath, and its application, I need not dwell longer upon the subject, but in conclusion would state that the benefit which has been derived from sulphur, thus employed in cutaneous diseases, is so great and obvious, that in countries where they are more common than with us, this mode of treatment has conferred a benefit upon human nature, little short of the discovery of vaccination as a protection against the small pox.

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*Of minor means of exciting perspiration.*

Jenning's vapor bath employed as to be described—bottles filled with hot water, and applied to the feet, thighs and axillæ—bags

filled with hot sand or ashes, &c. Such are the various means, by which, in a state of disease, we excite this important secretion—our selection being influenced by the state and condition of the surface, and the energy or power of re-action in the system.



## DIVISION VI.

### DIURETICS.

The next class of medicines of which I shall speak is Diuretics, or medicines which promote the secretion of urine. This is effected by such substances as are known to exert an action upon the kidneys. Their office in health seems to be, to relieve the vascular system from any distension, arising from too large a quantity of fluids being carried into it, as well as to convey through the urinary passages, such fluids as having served the purposes of the animal economy, have become useless. In disease these happy arrangements are broken up, and in some diseases, particularly in those in which swellings occur in various parts of the body, the superfluous fluids instead of being carried off by the natural passages, become effused in the several cavities of the body. It becomes therefore desirable, that we should be informed how these organs may be stimulated to a new and more active secretion, in order that these depositions may be removed, and the gland restored to a more healthy state. The secretion of urine is promoted in several ways.

1. By increasing the quantity of water in the mass of blood.

2. By introducing a substance, which may be a stimulus to the secretory vessels of the kidneys, and excite them to increased action.

3. By exciting the action of the absorbents.

Under the first head it may be observed, that if much fluid is taken into the stomach, and thence into the mass of blood, it must necessarily pass off by the excretories of the body, as the skin, or kidneys; and we commonly find, that an increase in the quantity of drink is attended with a proportional increase in the quantity of urine secreted—accordingly this increase of drink has always been considered the chief of diuretics.

There are, however, certain states of the body, in which it may be doubtful whether this means of increasing the secretion of urine, can be safely employed.

It sometimes happens, that the water of the blood, instead of passing off by the excretions, is effused in some of the cavities of the body, giving rise to the well known disease of dropsy, and in



such cases it may be suspected, that an increase of the water of the blood, occasioned by an increase of drink, may augment the effusion just mentioned, and aggravate the disease. This suspicion has prevailed so much with physicians, as to lead them in such cases, to enjoin as much as possible an abstinence from drinking; and it is alleged that such an abstinence, has, in some cases, entirely cured the disease. But the truth of this statement will perhaps not bear a very rigorous enquiry, and it may confidently be asserted, that such facts are at least of very rare occurrence, and the numerous instances in which such abstinence has been attempted with little or no benefit, has led many physicians to recommend that it shall not be attempted at all. It is in short a practice very difficult to enforce, for in few diseases is the demand for drink more urgent. Fortunately for the sufferings of the patient, as far as careful observation has gone, it has been decided that the use of drink is safe in dropsy, and that the quantity of urine voided, when it is permitted, is usually equal to the quantity of drink taken in; sometimes it is even greater, especially when the drink is mixed with materials slightly stimulant to the kidneys, for in whatever way the kidneys are excited to action, that action sometimes goes on, after the immediate stimulus has passed off; while on the contrary, the want of action, whether from the absence of the watery part of the blood, or other causes, itself conduces to a further inactivity. The best rule, however, is, that whenever the quantity of urine voided, is equal to the quantity of drink for the same time taken in, it is obviously safe to allow as much drink as the patient may desire, and by such indulgence the disease is not found to be aggravated. In fact, cases are recorded, successfully treated after this manner, by Sir George Baker, and Sir Francis Milman. For my part, says Dr. Cullen, I always thought it absurd in a physician to employ diuretics, while he enjoined an abstinence from drink, which is almost the only means of conveying these diuretics to the kidneys. So whenever diuretics are employed, it is at the same time proper to allow the free use of drinks, and there can be no doubt that drinking largely, has often contributed to the cures that have been made.

The utility of the practice is fully supported by experience, and by authority, and we must consider it a fortunate circumstance, that what is so useful, corresponds also with the desires of the patient.—*Cullen's Materia Medica.*

The second mode of increasing the action of the kidneys is, by introducing into the system such articles as are stimulating to them. The manner in which this division operates, is easily understood, as in this way we may suppose a direct application is made to the secreting vessels of the urine, and that thereby action is excited, and a more copious discharge produced. In this

manner it is probable that most of the saline diuretics operate. When given therefore in such doses as not to excite a cathartic operation, they are received into the circulating mass, are brought to the kidneys, in the course of the circulation, excite their vessels to increased action, and a large quantity of watery fluid is secreted.

Many of the saline preparations as Nitrate of Potash and the fixed alkalies, can be detected in the blood by chemical tests, and therefore there can be but little doubt that this is the mode in which they operate.

As far as we may judge from the odour of the urine, we may suppose that some vegetable substances, as turpentine, garlic, &c. pursue the same course, and experience informs us that they produce the same result.

That the saline diuretics act by being absorbed, we know from the following circumstance, that if during their exhibition a cathartic effect follow, either from the largeness of the dose, or from its combination with some purgative, no action is excited upon the kidneys. Thus the Bi-Tartrate of Potash or Cream of Tartar, in well regulated doses acts upon the kidneys, but if we increase the dose so that a cathartic effect follows its administration, no diuresis will ensue, since no absorption can take place under such circumstances. Nitre is subject to the same variety in its operation—if given in small doses it is taken into the circulation, and it operates as a diuretic, but if combined with a purgative no such effect will be discovered. Oil of Turpentine in doses of *ʒiij.* may so excite the urinary organs as to produce even bloody urine, whereas if given in the dose of an ounce, it will produce scarcely any apparent influence upon the kidneys, because the increased dose acts upon the bowels, and prevents its passage into the circulation.

Sulphate of Magnesia, Dr. Paris observes, does not readily produce any diuretic effect in the human subject, because it operates on the bowels, but the experiments of Vetit and Bracy Clarke have shewn, that if this saline compound be administered to the horse, whose bowels are not easily affected by purgatives, it acts powerfully upon the kidneys, and it is on account of this inirritability of the bowels of the horse, that diuretic medicines are more certain in their operation, than in the human subject, a fact which shews the importance of attending to the state of the bowels, during a course of diuretics, which require to be absorbed, before they can produce their effects.

The third mode in which diuretics operate, is by increasing the action of the absorbents. This is no doubt effected by the impression of a class of medicines upon the stomach, and by this impression nausea and diminished action of the arterial system take place. By a law of the system, the action of the absorbent and

arterial systems, are in an inverse ratio, so that when the latter is reduced, the former exercises increased energy. Squill, Digitalis, and Tobacco are of this class; there is no proof that they are taken into the system. It may be supposed, therefore, that they exert a peculiar action upon the stomach, which being extended to the arterial system, causes a depression of its action, and a consequent increase of the absorbent action, for they seldom or never produce their diuretic effect, without a concomitant reduction of the frequency of the pulse.

The action of the absorbents is increased by medicines which produce a cathartic impression upon the bowels, by increasing the action of the exhalents directly, and that of the absorbents indirectly. Hydragogue cathartics are of this character, they excite a copious watery discharge from the bowels, and the absorbents are thus stimulated to supply the serous part of the blood thus diminished. Such is the effect of the elaterium.

In the whole circle of medicinal operations, says Dr. Paris, there is nothing more wonderful than this, that an impression made on the internal surface of the *primæ viæ*, by a few particles of matter, should thus convey, by magic as it were, an impulse to the most remote extremities, rousing their absorbents into action.

The action of the absorbents is increased and diuresis produced, by medicines which increase the tone of the body in general. When dropsy is the consequence of debility, as after fevers, &c. any tonic, or even nourishing diet, may have diuretic effects.

The action of the absorbents is increased, by medicines which exert a stimulant impression upon the system. Of this description is mercury and other stimulants, which seem to do good by exciting the action of the different excreting organs, as the skin, the bowels, the kidneys, &c.

#### DISEASES IN WHICH DIURETICS ARE USED.

Dropsy is the disease in which diuretics are principally employed. The diminution of the urine, being a prominent symptom under every form of dropsy, the re-excitement of the secretion, at once suggests itself as a probable means for carrying off the preternatural accumulation of water, which apparently constitutes the disease.

Diuretic medicines have, therefore, always properly been administered in the treatment of dropsies. The manner in which they effect the removal of the fluid, is in some one of the modes which have been mentioned. Whether these be admitted, the practice is not the less common to employ diuretics, since they increase the discharge of urine, and diminish the watery effusions



which exist. Unfortunately we are ignorant of the circumstances which cause them sometimes to succeed and sometimes to fail, and which render one article beneficial and another inert. This we know, that where any organic affection of the viscera exists, no great benefit can be supposed to arise from the action of diuretics alone, and it is only when the disease depends upon a deranged condition of the absorbents, that advantage can be derived from their use.

Besides dropsy, diuretics are used in nephritic, and calculous affections, and in gonorrhœa. In the latter case, by increasing the secretion of urine, they lessen its acrimony and thereby diminish the pain of the discharge.

In asthma, dyspnœa, chronic catarrhs, and other chronic diseases of the lungs, diuretics afford relief, hence the remark of Baglivi—*In omnibus morbis pectoris, ad urinam spectandum*—I have on several occasions kept this maxim in my mind, and have observed that after employing purgatives with a view to remove irritating substances from the *primæ viæ*, and other means to subdue action, unavailingly, that benefit has resulted from the administration of diuretics.

It was a favorite saying with the old physicians, that in stomach or sympathetic coughs, cathartics were beneficial, and that the pectoral coughs were more relieved by diuretics.

I have frequently alluded to the combinations of medicines. There is perhaps no class in which a combination of two or more substances, possessing similar powers, is so frequently important as in diuretics. Thus the use of potash, joined with bitter vegetables, is recommended by Sir John Pringle as an efficacious medicine, and I have derived great advantages from uniting the crystals of tartar with an infusion of Quassia.

The alkaline substances by acting upon the bowels, are often prevented from reaching the kidneys, so their diuretic effect may often more certainly be secured, by giving an opiate at the same time, according to the practice of Dr. Mead.

A combination of squill with digitalis, and some of the less purgative preparations of mercury, as the blue pill, is occasionally very active in its diuretic operation, and in children, or in old and feeble people, the union of the spirit of nitrous æther, or of other diuretic substances, with bark, or other vegetable tonics, appears to be often very serviceable.

To ensure to this class of medicines greater certainty, I shall subjoin a few rules, which may be important in their application:

Rule I. The diuretic effect of any article in general, cannot be obtained, should it produce any disturbance of the bowels, the cathartic and diuretic action of medicines being opposed to each other.

Rule II. In the administration of diuretic medicines, it is equally necessary to attend to the state of the skin. If during their administration these vessels are excited by external warmth, their action is diverted from the urinary organs, to the exhalents on the surface, and diaphoresis is occasioned. To produce a diuretic effect, the surface should be kept cool.

Rule III. Diuretics should not, if it can be avoided, be administered in bed.

Rule IV. When the full effect of the medicine is required, give diluent drinks freely.

## SALINE DIURETICS.

*Such as operate by stimulating the secretories of the Kidneys.*

*The Preparations of Potash.*—The sub-carbonates and carbonates, were formerly much celebrated for their diuretic properties. The ashes of several plants, as common broom, (*spartium scoparium*), wormwood, &c. which owed their efficacy entirely to this salt, were much employed in dropsies, particularly upon the authority of Dr. Sydenham, whose account of their good effects is sustained by Dr. Munro. They were directed to be given in doses of ℥i. three times a day, which were increased to ʒiiss. and their use continued for some time. Their effect was to produce a considerable evacuation of water.

In whatever manner the sub-carbonate of Potash is employed, it is a very unpleasant medicine, and cannot be continued for any length of time, without producing irritation of the first passages.

If used, it is best adapted to those cases attended with acidity, and other states of deranged action. Being, however, inferior in its diuretic properties to other combinations of this alkali, it has fallen into disuse. Combined with certain bitter infusions, its powers are much improved.

Thus exhibited, according to Sir John Pringle, its diuretic properties are increased, while it removes gastric uneasiness, and invigorates the system generally.

The dose of the sub-carbonate or carbonate of Potash, is 20 or 30 grains, dissolved in a large quantity of water, and repeated 3 or 4 times a day.

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*Acetate of Potash.*—This salt was at one time so much esteemed as to be called *Sal. Diureticus*. It is obtained by saturating the Potash of the sub-carbonate of Potash with distilled vinegar, and evaporating the solution to dryness.

It was said to be a medicine of great efficacy, and may be so used and managed as to prove either mildly cathartic or power-

fully diuretic—few of the saline diuretics being equal to it in virtue. It has declined, however, very much in general estimation, and is now rarely employed.

For producing a diuretic effect, it is given in doses of from ℥i. to ℥i. every 3 or 4 hours, in any bland fluid. Doses of ℥ii. or ℥iii. have a cathartic operation.

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*Super-tartrate or Bi-tartrate of Potash—Cream of Tartar.*—This Salt exists in nature, particularly in the juice of the grape. It is deposited from wine, in the progress of the slow fermentation which it undergoes when kept. The deposit adheres to the side of the cask in which wine is preserved, and consists of Tartaric Acid, combined with Potash—the acid being in excess—hence the term bestowed upon it. It is scraped from the sides of the cask, purified by various processes, and rendered fit for use.

Tartar in its crude state, as originally deposited in wine casks, is of a brownish red colour, and is purified by dissolving it in warm water and adding wood ashes and albumen. The albumen coagulates, floats, and entangles various impurities, whilst the latter, occasioning an effervescence, throws these up to the surface, whence they are removed by repeated simmerings.

As a diuretic, the Cream of Tartar is infinitely to be preferred to the other saline preparations in the treatment of dropsy, and is particularly adapted to those cases, which are accompanied with increased or febrile action.

The usual mode of administering it as a diuretic, is to dissolve ℥ss. to ℥i. and ℥ii. in a quart of water, which quantity is drunk during the day.

The forms of dropsy to which it is best adapted, are ascites and anasarca. It is least beneficial in hydrothorax.

Experiments have been made by different persons, upon the utility of this article in dropsical cases.

Dr. Home instituted a series of experiments upon the effects of this salt in the various forms of dropsy, and his report of the result was very favorable—of twenty cases under his care, the dropsical symptoms disappeared in thirteen, and in seven they were not removed.

He generally ordered ℥ss. to be taken in the morning, at different times before breakfast, dissolved in about ℥x. of water—the dose being increased.

Dr. Ferriar found the Cream of Tartar the most effectual remedy of several others that were tried. He gave it after the manner of Dr. Home in forty-three cases,—of these thirty-one recovered—nine died, and three were relieved. The common operation of this medicine was to give some loose stools, and after taking it some time it acted as a very powerful diuretic.



By Dr. Manghini, it was employed with considerable benefit. He relates fifteen cases which were under his care, and several which were under the care of others—most of which recovered under the use of this medicine, in the quantity of  $\text{ʒii.}$  to  $\text{ʒi.}$  in the day, dissolved in water or weak broth.

Such is a brief abstract of the success of several distinguished individuals with the Bi-Tartrate of Potash. It is undoubtedly a very useful article, and though not as actively diuretic as you would be led to believe by authorities, yet it is more generally applicable, is more agreeable to the tastes and inclinations of patients, and can be continued longer without exciting disgust, than most others. To obtain success its use must be persisted in for some time. In some cases, it has been continued from 20 days to 2 or 3 months. Often it has had no effect upon the disorder for the first thirty or forty days—though afterwards by persevering in its use, it has effected a cure.

I have used this article and have generally been well pleased with it. In habits debilitated by the continuance of the disease, or in persons advanced in life, I have commonly administered it in an infusion of Quassia or some other tonic, and have been well pleased with the combination. Upon the whole, though this article is not commonly considered a very powerful diuretic, it is a very useful one. But you must expect disappointment, both in the employment of it, and in curing dropsy:—a disease well denominated *dirus hydrops*, particularly when connected with visceral obstructions.

The use of this article is attended with some inconvenience. It is frequently necessary to give it in such large doses, to obtain its diuretic effect, that it excites nausea and flatulency, weakens the appetite, and injures the tone of the stomach. These effects lead to a preference of other diuretics, and render it necessary to substitute them when it has received a fair trial.

Cream of Tartar combined with Jalap, in the proportion of  $\text{ʒi.}$  to  $\text{ʒii.}$  of the former with xv. or xx. grains of the latter, is an excellent hydragogue cathartic.

*Adulterations.*—This article is frequently much adulterated,—sometimes with silicious pebbles, bruised into small fragments, sometimes with Tartrate and Sulphate of Lime.

Several of the articles of which I have spoken exist in combination with vegetable acids. It is proper, before I proceed to those salts, formed by a union of the alkalies with a mineral acid, to state to you the changes which take place upon these substances, in the alimentary canal. The digestive organs appear to possess the power of decomposing the saline compounds into which the vegetable acids enter as ingredients, and of eliminating their alkaline bases, so that the alkaline substance enters the system.

probably combined with carbonic acid. The compounds with mineral acids are not affected in the same manner, so that they enter the circulation in their combined state.

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*Nitrate of Potash*—*Nitre* or *Saltpetre*—Is another of the combinations of Potash. It is found native, or prepared as I have already mentioned.

Its medicinal properties are refrigerant and diuretic. When taken in repeated small doses, it abates heat and thirst, in diseases of increased excitement, diminishes the force of the circulation, and increases the secretion of urine, in which the salt may be detected by chemical processes. Possessing these properties, it has long been prescribed, and is unquestionably an excellent medicine in tonic dropsy.

Taken from the extent of  $\mathfrak{z}\text{i}$ . to  $\mathfrak{z}\text{ss}$ . in the course of the day in repeated doses, it diminishes the heat of the body, and the frequency of the pulse, and acts upon the secretion of urine, but it is apt to excite the stomach and to produce pains.

Its diuretic effect is best promoted by being largely diluted. The quantity above directed is dissolved in 3 pints of water, or what is better, in cider, and this drunk in the course of twenty-four hours. Thus exhibited it is less apt to disagree with the stomach, and its action upon the kidneys is augmented in a ten-fold degree. That this salt is actually separated by the kidneys, is proved by facts related by Dr. Paris.

Nitrate of Potash is much used in Hæmoptysis. It is well adapted to these cases, and may be given in large doses, from  $\mathfrak{z}\text{i}$ . to  $\mathfrak{z}\text{ss}$ . in the twenty-four hours. Thus employed, it has removed the early symptoms of this disease, and has excited a free discharge of urine.

It is probable that its good effects in these cases, may depend upon its stimulating impression upon the capillaries, since the fluids becoming impregnated with this salt, are conveyed to the affected part, where it may exert a constriction of these vessels, and an abatement of the hæmorrhage.

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I shall now speak of a class of diuretics of a more stimulating nature, and which on that account are employed in a different state of the system.

The first of this class is the *Tinctura Cantharidum*. The Cantharides or fly, is found in all the southern parts of Europe, particularly Spain and Italy, inhabiting the Ash, Elder, Lilac and other trees. These insects are of a bright green colour, and when alive have a foetid smell. They are collected by shaking them from the branches, into a cloth spread beneath the tree, and afterwards killed with the fumes of vinegar or burning sulphur. They are

then dried in the sun, or by a stove, and packed in small chests or casks.

The active matter of *Cantharides* is extracted by water and by alcohol, and a process is given by Robiquet, by which it can be obtained in a pure and concentrated state. To this the term *Cantharidin* has been applied.

*Cantharides*, either in the form of powder or tincture, has been long employed in medicine, and in whatever manner used, exhibits a strong determination to the urinary organs. They are remarkable for the irritating operation which they exert upon all the organic structures of the body. In contact with the organ of taste, they excite a sensation acrid and caustic—on the olfactories an odour penetrating and highly disagreeable—applied to the skin, the cellular membrane, the mucous surfaces, they excite an inflammation somewhat marked in its appearances. But the irritating operation of these insects, is particularly remarkable upon the organs which serve for the secretion and discharge of urine, and upon the genital organs. The digestive organs are less readily acted upon, and when affected nausea is excited, with colicky pains, vomiting, frequent slimy dejections, like the evacuations which attend dysentery.

Such is the action exercised upon the different parts of the body, by this singular substance when taken in an over dose; but when employed in proper doses, instead of exciting difficult and painful discharges of urine, or its total suppression, it occasions a copious diuresis, and may often be usefully employed for this purpose.

To be beneficial, its use must be proscribed in habits that are plethoric, or of an inflammatory character, as in these cases the distressing symptoms which follow its employment are more generally produced.

It is best adapted to the atonic states of dropsy, where the system is much debilitated, and where the use of stimuli is required. Under these circumstances, it may be given with very good effect, and in pretty considerable doses. From  $\mathfrak{zss}$ . to  $\mathfrak{ziii}$ . may in such conditions be administered, and a copious flow of urine will commonly be found to take place.

In the dropsies which succeed Scarlet Fever, or other diseases where tonics are required, the Tincture of *Cantharides* has been employed advantageously in conjunction with the cinchona. In this manner it was exhibited by Dr. Ferriar in several cases, and the issue was very favorable.

*Cantharides* is however more beneficial in certain local diseases of the urinary and genital organs. In incontinence of urine, proceeding from relaxation of the sphincter vesicæ, it more frequently effects a cure than any other medicine. This would readily



be supposed from the irritating operation which it exerts upon this part of the system.

It is equally serviceable in that species of incontinence of urine, which many young persons experience during sleep.

In Gleet and long protracted Gonorrhœas, this article has long been much extolled. It is worthy of notice that when a cure can be accomplished by this substance, benefit is soon derived from its employment. For this reason, when it neither diminishes nor removes the Gleet in the course of five or six days, it should be a rule never to continue it longer, but to have recourse to some other method.

Where it is beneficial, from the great tendency of Gleet to return, its use should not be discontinued as soon as the discharge ceases, but it should be persisted in for ten days or a fortnight after all the symptoms have entirely gone off.

In employing this article it should be given in such doses as to excite its specific effects upon the bladder or urethra.

In these diseases, the following combination succeeds better than the simple article.

R. Tincture Cantharides, ʒvi.

Balsam Copaiva, ʒii. m.

10 to 15 drops three times a day—gradually increased until a cure is effected, which is commonly in a short time.

In obstinate Leucorrhœa, it was strongly recommended by Mr. Robertson. He recommended the tincture to be taken diluted with water, beginning with ʒss. united with ʒvi. of water, and a table-spoonful to be taken three times a day—the dose to be gradually increased until the patient takes ʒiv. of the tincture in 24 hours. In this manner it is to be persisted in, until the patient experiences some inconvenience in passing urine, and a puriform discharge from the vagina is produced. Notwithstanding the very confident manner in which Mr. R. has spoken of the efficacy of the Cantharides in this disease, frequent trials of it, by no means entitle it to the very high consideration in which it was held by him, but in common with many other substances, it frequently disappoints our expectation.

It is, however, entitled to a trial and should not be overlooked.

In other affections of the genital organs, proceeding from weakness or depraved habits, it is spoken of in very high terms. Dr. Hosack has eulogised it in such terms, in impotence and seminal weakness, that it would be an omission to pass it by unnoticed. He directs it to be given in very large doses, from 2 or 3 drachms to 1, 2 or 3 ounces in the 24 hours. Thus employed, he states that he has not failed in a single instance, though there had been cases under his care of four, five and six years duration.

Besides these diseases, the tincture has been found of singular

service, joined with a decoction of Elm Bark, or Sarsaparilla, in obstinate cutaneous diseases.

The usual dose of this article is from 12 to 15 drops, increased to the extent of producing irritation of the urinary organs. Of the powder from half a grain to two grains.

It is a singular circumstance in the history of the Cantharides, that while their action is so peculiarly irritating to the human system, there are insects and animals which subsist upon them—the hedge hog devouring hundreds of them with impunity.

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*Family Coniferæ—Pinus Palustris.*—The next article is the Oleum Terebinthinæ or Oil of Turpentine. From the Pinus Sylvestris, a resinous juice exudes in considerable abundance. It is thick and tenacious, and from it, by the addition of water, is distilled an essential oil, the Oleum Terebinthinæ of the shops. It is light, limpid and volatile, has a strong penetrating smell and a pungent taste. It is a powerful stimulant, directed more particularly to the urinary passages, as is evident from the violet odour it communicates to the urine, and from the inflammation it excites when given in too large doses.

The dose as a diuretic is 15 or 20 drops—larger doses, act as a cathartic—affording an instance of the important influence of quantity or dose, in determining the specific operation of a medicine. In this instance, ℥ii. may so excite the urinary organs as to produce bloody stools, whereas ℥vi. to ℥i. will stimulate the bowels, and scarcely produce any apparent effect upon the kidneys. Large doses, by stimulating the bowels, excite a copious secretion of the fluids of the first passages, and this stimulus being extended to the muscular coat of the intestines, their peristaltic motion is increased, the substance becoming in the first instance diluted and then carried out of the system.

The best form of administering the Oil of Turpentine is to triturate it with mucilage or honey, and thus diffuse it through some aromatic water.

Spirits Turpentine, gtt. xv. to xx.

Honey, ℥iiss.

Cinnamon Water, ℥i. mix for a draught.

In obstinate cases of Gleet and Gonorrhœa of long standing, this article is a very useful auxiliary.

As a diuretic the Spirits of Turpentine is applicable to the same state of the system as the preceding. It is not often resorted to for the purpose, and I do not know of any well authenticated cases in which it has been employed. It is, however, a very important article of the Materia Medica, and the variety of purposes to which it is subservient, with the powerful influence which it ex-

erts on many occasions, entitle it to a high degree of consideration. These will be specified on a future occasion.

*Family Leguminosæ—Copaifera\* Officinalis.*—Nearly allied to the Spiritus Terebinthinæ is the Balsam Copaiva. The term balsam being now generally restricted to compounds of resin and benzoic acid, is not applicable to this substance—nor is it strictly a liquid resin, but a compound of volatile oil and resinous matter, therefore called oleo-resin. That it is an oleo-resin is proved by submitting it to distillation, when a volatile oil passes over, which is highly odorous and pungent, upon which the virtues of the Copaiva depend, and there remains an insipid resin in the retort, which has sometimes been employed in medicine, under the name of the Inspissated Balsam of Copaiva.

This oleo-resin, one of the most valuable and active for medicine, is obtained from the *Copaifera Officinalis*, a tree growing in the West Indies and in South America.

The oleo-resin or balsam, (which name, for convenience, I shall continue,) is obtained by boring holes in the trunk near its base, from which it flows out rapidly, so that twelve pounds are collected in three hours. It is colourless when flowing from the tree, after which it becomes of an amber yellow, and considerably viscid, but retains its transparency. The smell of Copaiva is fragrant and powerful—to the taste it is bitterish, heating, aromatic, and of considerable duration in the mouth—it dissolves readily in rectified spirits, especially if the menstruum is previously alkalized, when the solution has a fragrant odour.

This article is unquestionably a very active substance when taken into the stomach, and its medicinal virtues, though perhaps overrated, are, however, very considerable. When taken in doses of a few drops, it excites the energies of the stomach, and sometimes favors rather than disturbs the functions of this organ.

In large doses, as one, two or three drachms, it excites very considerable irritation, and this is principally exerted upon the large intestines. This irritation manifests itself by alvine evacuations in a few hours after it is taken, by colicky pains, by tenesmus, and much thirst. These evacuations, by carrying the Copaiva out of the system, render of no effect the ulterior impressions it is often designed to make. When given in such doses that it is not conveyed by the bowels out of the system, it is absorbed—the pulse is increased in frequency—the animal heat is augmented, and the secretion of urine is more abundant. That the balsam introduced into the system is separated by the kidneys, is proved by the fact, that the urine of those who have been upon the use of this reme-

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\* Called *Copaifera*, from *Copaiva* the Indian name, and *Fero* to produce.



dy acquires a bitter taste, and a very strong odour of the balsam.

From its strong determination to the kidneys, it has been supposed peculiarly suited to the diseases of these organs. As its effects, however, are heating and irritating, it is capable of producing much mischief as well as good, and it is not now much resorted to in these cases.

From its action upon the kidneys, and its diuretic operation, this article has been employed in diseases of the Genital organs—in Gonorrhœa—Gleet—Leucorrhœa, and in these diseases the utility of Copaiva is often exhibited. Different opinions prevail respecting the periods of the disease in which it should be employed. By some it is said to be adapted to the early stages of the disease, and during the most inflammatory symptoms, and that when employed in pretty large doses, it relieves the ardor urinae, chordee and other symptoms of the complaint. It is the practice of others to moderate these symptoms by rest, diluent drinks, moderate and spare diet, and the use of cathartics every other day, until the urgent symptoms have subsided, and then to have recourse to the balsam. This practice has always appeared most rational, and it is the one I have commonly pursued. Premising this preparatory course, I have found the disease to subside in a very reasonable space of time. Injections are seldom necessary, and in consequence of their being only employed at the conclusion of the complaint, there never succeeds swelling of the testicles, or hernia humoralis, as it is called, which commonly proceeds from the discharge being checked too soon.

In curing Gonorrhœa, this substance acts in two modes. By the irritation it excites upon the surface of the intestinal canal, and the copious evacuations following, it reduces the general excitement of the system, and acts also by a revulsive operation. Or the particles being absorbed and the urinary secretion being impregnated, it changes the morbid action of the diseased part in its passage, and substitutes a medicinal impression which is readily cured, for that of the existing disease of the membrane of the urethra. Upon this principle other diseases are frequently subdued. An inflammatory afflection of the conjunctiva of the eye, is removed by another impression being substituted for the existing diseased one, as by the use of stimulating collyria—or ulcerations of the skin by other stimulating applications. In confirmation, I may add the remark of Dr. Cullen, who says that he has seen the Copaiva and Spirits of Turpentine, produce inflammation of the urethra, to such an extent as to occasion a suppression of urine, and that the Gonorrhœa which had existed some time, has been completely cured when these inflammatory symptoms have been reduced.

Upon the same principle is it useful in Leucorrhœa. It should

not however be forgotten, that accompanying this disease, there is often considerable debility of the general system, as of the digestive organs, and that not unfrequently, this article, by the irritation which it excites, can only be employed with much circumspection.

As a diuretic in dropsy, it is seldom resorted to, either from its operation being not so decided or efficient as to entitle it to particular consideration in these cases, or from its taste and other qualities rendering it unsuited to the generality of subjects with this disease. Some cases, however, are related, in which it has been employed advantageously.

From the action which it exerts upon increased and morbid discharges of the mucous membranes, it has been employed with much advantage in chronic catarrhs, in humid coughs, and the chronic affections of the pulmonary organs. It should, however, be recollected, that as this medicine heats and irritates the system to a considerable degree, it should only be employed in cases where action has subsided, or where the discharges are kept up, and the disease prolonged, by a relaxation or enfeebled morbid action of the vessels of these parts. It is used in these cases in the form of an emulsion, prepared by being rubbed up with the yolk of an egg, or mucilage of gum arabic, or with almonds. In using the almonds they are soaked in hot water for a short time, in order to separate the outer covering, they are then beat up with the balsam, water being slowly added, and a mixture, by no means unpleasant, is thus formed. A small quantity should only be prepared at a time, as the mixture is liable to ferment.

Upon a like principle this article has also been employed in protracted diarrhœas and chronic dysenteries.

It is given in doses of 20 drops combined with 8 of Laudanum, every four hours, in two table-spoonful of mucilage, and some aromatic water, as cinnamon water.\*

*Of the several modes of exhibiting the Balsam.*—The Balsam may be taken on sugar, or dropped in any aromatic tincture, or floating in a little of the compound tincture of Gentian, or taken in a table-spoonful of sweet orange juice—or it may be given in combination with other articles.

The formula recommended in Dr. Chapman's Therapeutics answers very well, and I would refer you to his work. I would mention the following, which I have used with advantage—it disguises and covers the unpleasant taste of this article, does not excite much disgust, it is retained very well, and in this manner is obviated one of the greatest objections to its use. To ensure its

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\*Vide Observations on the use of the Balsam Copaiva, in Diseases of the Mucous Membrane of the Intestinal Canal, by R. LaRoche, of Philadelphia.

good effects rest is necessary, avoiding stimulating drinks, and diet, and riding on horse-back. It is as follows.

R. Balsam Copaiva,  $\mathfrak{z}\text{ii}$ . to  $\mathfrak{z}\text{ss}$ .—to be well rubbed with powdered Gum Arabic, or the

Yolk of an egg, or

Sweet Almonds blanched, a dozen—add

Water slowly,  $\mathfrak{z}\text{vi}$ .

Sweet Spirits of Nitre,  $\mathfrak{z}\text{ss}$ .

Laudanum,  $\mathfrak{z}\text{i}$ .—dose  $\mathfrak{z}\text{ss}$ . to  $\mathfrak{z}\text{i}$ . repeated frequently.

In some cases much advantage is derived by adding  $\mathfrak{z}\text{i}$ . or  $\mathfrak{z}\text{ii}$ . of the Oil of Copaiva to the mixture.

Balsam Copaiva is frequently combined with the Tincture of Cubebs, and this forms a mixture which is often very effectual as well as agreeable, as follows:

Balsam Copaiva—Tincture of Cubebs, equal parts. Dose, a tea-spoonful or more several times a day.

This combination you will find can often be substituted for the foregoing, the taste of the balsam being much disguised by the tincture of Cubebs. It is readily taken, its action is quick and prompt, and with it I have succeeded in curing the disease in a few days.

A very efficacious formula is an emulsion made with gum arabic and a few drops of aq. potassæ, to which may be added a little sugar and few drops of nitrous æther.

The Balsam is often agreeably administered in the form of pills. When mixed with calcined magnesia to a proper consistence, it may be readily rolled out and formed into pills. The pills become more solid after a few hours. Magnesia appears to act specially upon the balsam, and to this may be mainly attributed the solidification. No other alkali exerts the same action—potash, soda, lime, or their carbonates, or the carbonate of magnesia. They form saponaceous compounds, capable of being suspended in water, and resembling a mucilage of gum arabic.

The Copaiva may be given in the form of enema in Gonorrhœa.

M. Velpeau, upon the authority of Brettonneau, has employed it in enema, rubbed up with mucilage or the yolk of an egg, to the extent of  $\mathfrak{z}\text{ii}$ . to  $\mathfrak{z}\text{i}$ . a day. To the enema a little laudanum is added, to allow of its retention in the rectum, and its absorption. In this manner it was used in twenty-two cases at the Hôpital de Perfectionnement in Paris. They were cured quickly, in six and seven days, or at least had their symptoms greatly mitigated—after the eighth or tenth day no advantage is derived from its use, and it is affirmed that cases resisting this mode of administration are not benefitted if the balsam is taken by the mouth.

*Preparations of the Balsam.*—The Balsam consists, as I have mentioned, of an essential oil, forming about one-half of its weight, and of a resin.



The oil may be separated by distillation. It is limpid and colourless, is volatile and inflammable—has a peculiar taste and smell. This oil may very well be substituted for the Balsam, which can with difficulty be continued for any length of time, in consequence of its unpleasant taste—its disagreeing with the stomach, either exciting vomiting or destroying the appetite.

The oil, as being much less unpleasant, may be substituted. The following formula may be employed.

R. Oil of Copaiva, ℥ii.

Powdered Gum Arabic, ℥ss.

Cinnamon Water, ℥ii.

Simple Syrup, ℥iss.

Laudanum ℥ss—Dose, ℥ss., repeated frequently.

The oil, like the balsam, has its remedial effects counteracted, if alvine evacuations are produced. Laudanum is therefore a useful addition. Drs. Bard and Cullerier, have witnessed its effects in thirty patients, who were cured in five or six days.

*Resin of Copaiva*—Is what remains after the oil has been drawn off. It has also been administered in pills. The dose is 8 grains, made into two pills, three times a day. The properties of the article are much impaired by the operation to which it is subjected.

*Consolidated Copaiva*.—Prepared by adding the distilled oil to the resin—Containing the oil and resin it is preferred, being a more active article. Dose the same.

*Adulterations*.—The balsam is easily adulterated with the thinner oils, or with turpentine. The detection of this fraud is often difficult, on account of the potency of the smell and taste of Copaiva, which covers almost every other. M. Bucholz asserts, that if it does not dissolve in a mixture of four parts of pure alcohol and one of æther, it is adulterated.

The evaporation of a drop of the suspected balsam upon a piece of unsized paper, ought to be added. If the balsam be pure, a resinous spot is left, but if it be adulterated with a fixed oil, it is greasy and soft.

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*Family Polygalæ—Polygala Seneka—Seneka Snake Root*.—This is a perennial plant, and grows wild in many parts of the United States, particularly in Virginia.

*Description of the Plant*.

Root fibrous and perennial.

Stem, 8 to 14 inches high, slightly pubescent.

Leaves nearly sessile, lanceolate, and oval, sometimes very wide, when fully grown generally acuminate.

Flowers, somewhat clustered, in a terminal spike, sessile, white.

Class, diadelphia, decandria.

The root, the part used, is woody, variously bent and contorted,

and appears as if composed of joints. It is inodorous, its taste is insipid and mucilaginous at first, but it soon changes to an impression acrid and biting. It is in the bark of the root, that this irritating quality resides.

The effects which this article excites, are so diversified, that it is difficult to assign the place which it ought to occupy in a methodical distribution of medicinal agents. It is an active and diffusible stimulus, and acts upon most of the secretory organs. It is diuretic, diaphoretic, emmenagogue, expectorant, and excites salivation.

The several actions which it excites are so important, as to require consideration under separate heads.

It is with its diuretic property that I am at present concerned, and in this respect it has been much celebrated.

Dr. Milman in his treatise on dropsy, speaks in a very favourable manner of this medicine. He relates four cases in which it was employed—two were cured and two relieved. In the last case in which it was used, the patient's thighs and legs, as well as his hands and feet were much swollen—the eyelids were greatly enlarged, there was not much water in the abdomen, the complaint having come on slowly, and gradually increased. He was placed upon the use of a decoction of seneka root, joined with the Bi-Tartrate of Potash, and was perfectly cured.

By Dr. Hartshorn of Philadelphia, this article is spoken of in high terms.

To these commendations of the Seneka, the respectable authority of Dr. Percival may be added, who says, that in hydrops pectoris the Seneka root in liberal doses sometimes answers every intention, and operates powerfully by the bronchial glands, and the kidneys, to the great relief of the patient. From the very stimulant power which the Seneka possesses, it is not proper in those cases of dropsy where there is great activity of the arterial system. It should not be administered until the excited state of the system has been reduced.

The state of the system, therefore, to which it is best adapted, are those cases of general tumefaction which depend upon a very feeble absorption, and are connected with a general cachectic or vitiated state of the system. When with this there exists a pulse weak and languid, the decoction may be administered with hopes of success. It is given in the form of a strong, or nearly saturated decoction of the root, and may be taken in liberal doses.

It is not sufficient employed alone, but requires the use of other articles. In the first case cited, which appears to have been dropsy of the cellular membrane, it was combined with the Bi-Tartrate of Potash, which is best adapted to this species of dropsy. In the case related by Dr. Hartshorn, other means were employ-

ed, and to the acknowledged efficacy of Calomel in quickening the action of the absorbents, much of the success which followed is to be attributed.

In Hydrops Pectoris, it cannot be trusted alone, but is a very useful auxiliary.

Besides dropsy, the Seneka has been recommended in high terms in croup, and as an expectorant in pneumonia and pleurisy. By Dr. Tennent, of Virginia, to whom we are indebted for the introduction of this article into general practice, its efficacy was particularly extolled in the inflammatory affections of the Thorax, and he directed it in the very commencement of the disease. By him it was conceived, that there was something in the acrid and irritating qualities of the root, which was capable of arresting inflammation of the pulmonary organs. Though the utility of this article is unquestionable, and its efficacy has been frequently tested, yet it is at the same time acknowledged, that in all these cases recourse must be had to the lancet, and the warmest advocates for the Seneka admit, that in pleurisy repeated bleeding is at the same time not to be overlooked.

The period in these diseases in which it should be resorted to, is after the inflammatory symptoms have abated, and the patient is harassed with a dry cough, difficult expectoration, with slight feverishness, and a constricted skin.

Under these circumstances, the decoction of this root will be found to afford great relief.

In Croup it is also employed in similar states of the system. It is given in decoction or in powder, combined with an equal quantity of liquorice root, which takes somewhat from its unpleasant taste. The decoction as commonly prepared, is made by pouring a pint and a half of water upon  $\mathfrak{zss}$ . of the root and boiling down to 1 pint, adding a little liquorice root. Dose,  $\mathfrak{zss}$ . to  $\mathfrak{zj}$ . Of the powder, grains ten to  $\mathfrak{vi}$ .

The decoction recommended by Dr. Archer in croup, is much more active than that usually given. It is prepared as follows.

Seneka Root bruised,  $\mathfrak{zss}$ .

Water,  $\mathfrak{zviij}$ . boil to  $\mathfrak{ziv}$ .

Dose, a tea-spoonful every 15 minutes until it operates, which is commonly by vomiting.

I need hardly state to you, that in the curing of the bite of the Rattle-snake, for which it was introduced in the *Materia Medica*, it is wholly inefficient.

#### DIURETICS WHICH OPERATE BY INCREASING THE ACTION OF THE ABSORBENTS.

The next Diuretic of importance is the *Scilla Maritima*, or Squills.



Its natural history has already been pointed out, and, according to the dose, it proves diuretic, expectorant, emetic, or purgative.

As a diuretic it is used in all the forms of dropsy, though probably it is best adapted to Hydrothorax. In the early stages of Hydrothorax, medical treatment does a great deal, principally by means of diuretics, and Squill is by far the most powerful of any of them. This article gives out its virtues so perfectly to different menstrua, as to make the form of its exhibition in that respect, a matter of indifference. Water, Vinegar, Wine, Alcohol, dissolve the active principles of the roots, and are possessed of their virtues. A solution is more accurately and more easily dosed than the powder, and a preference is given to it.

A minute attention to its dose is likewise of considerable consequence. It never operates so powerfully as when given in the fullest quantity which the patient can bear, without sickness. It is therefore proper to begin with a dose of the vinegar, tincture or syrup of Squills, so small as not to incur any reasonable chance of sickness, and to increase the quantity gradually, until either the desired effect takes place, or some degree of nausea is produced.

Just under this point it should be continued, until it operates favourably, which it will often do in a few days. In this manner it may be exhibited to a considerable extent, and commencing with thirty drops at a dose, the quantity may be increased to  $\text{zss. a } \text{ʒi.}$  in the twenty-four hours. With the above cautions, the Squill will be found to produce very great effects. The urine becomes pale and copious under its use, proportional relief is obtained in the breathing and in the diffused swelling, and it seldom either purges or palls the appetite. Whether it will cure, depends much upon the cause which has given origin to the disease.

In Hydrothorax when complicated, the Squill is combined with Calomel, in doses of 2 grains of Squill and 1 of Calomel, made into a pill and taken twice or three times a day. By this combination the diuretic operation of this article is increased, and we are in possession of one of the best formulæ, in the treatment of this dangerous and distressing form of dropsy.

Squills is sometimes combined with the Nitrate of Potash, in dropsical swellings and in nephritis—and instances of cures are related by giving patients from 2 to 4 grains of Squills, with 10 or 20 of Nitre.

It is also combined with Blue Mass and Digitalis in the following proportions.

℞. Powdered Squills,  $\text{g. iii.}$

Blue Mass,  $\text{g. ii.}$

Powdered Digitalis,  $\text{g. ss.}$  made into a pill.

To be taken every night and morning.

Besides dropsy, the Squill has been equally celebrated in the

diseases of the respiratory system. It is well adapted to promote expectoration, and to relieve the Bronchia when oppressed with a collection of mucus. It is properly resorted to in the conclusion of Catarrhal and other Pulmonary Affections, when inflammatory action has subsided, and when nothing is to be apprehended from its stimulating property.

In asthmatic affections, or dyspnœa, occasioned by the accumulation of viscid phlegm, it has also been held in the highest estimation. As an expectorant, therefore, the Squill may be supposed, not only to attenuate the mucus, and thus facilitate its ejection, but by stimulating the mucus follicles, to excite a more copious excretion of mucus from the lungs, and thereby to lessen the congestion, upon which the difficulty of respiration very generally depends. Hence in all pulmonic affections, excepting those of actual and violent inflammation, the Squill has been found a very useful medicine. In these cases the preparations of Squills are employed in small doses frequently repeated.

In the diseases of children, connected with a secretion of mucus in the bronchial passages, and difficult expectoration, the preparations of Squills are very valuable. They are safe and easily administered—they act gently upon the stomach, and excite vomiting:—also by stimulating the throat and parts adjacent, and by a sympathetic connection of the lungs with the nerves of the stomach, expectoration is promoted.

Useful as this article confessedly is, as an expectorant, its powers are much improved by combination with other articles, such as the Polygala Seneka, and Tart. Antimony, as in the compound called Hive Syrup—and in asthma and dyspnœa without fever, Squill, combined with Ammoniacum, is perhaps the best remedy we can employ.

The officinal preparations of Squills are very numerous. The most important are

1. Acetum Scillæ, or vinegar of Squills.
2. Oxymel Scillæ.
3. Vinum Scillæ.
4. Tinctura Scillæ.

*Infusion of Squills.*—This is a convenient and very useful form of administration, and in my practice one of the most successful, in removing dropsical effusions.

It is prepared as follows:

℞. Squill Root, ʒii.

Orange Peel, ʒii.

Boiling water, ʒxii.—dose, half a wine-glass every two or three hours.

Dose, powder, ii. to viii. grains.

Tincture, ʒss. to ʒii.

Vinegar, same.

The next article of the class of Diuretics, which, for its extensive employment, and varied character, becomes highly interesting, is the

*Family Scrophulariæ—Digitalis Purpurea—Foxglove.*—The *Digitalis Purpurea* is the one in common use, but the *Digitalis Lutea* is said to be stronger, and to possess all the valuable properties of the former, without its injurious ones.

Root—biennial.

Stalk—erect, and rising to the height of four or five feet.

Leaves—large oval, narrowed to the point, downy, serrated.

Flowers—in a long terminal spike, large, monopetalous, bell-shaped, purple, bearing a resemblance to the finger of a glove, hence the name *Digitalis*. Grows in England along road-sides and hedges.

The *Digitalis* is not a native plant, but is cultivated in this country; it grows luxuriantly, and commonly attains the height of 2 or 3 feet. The blossoms appear on the second year, and are elegantly mottled—the leaves only are used, and they are gathered when the plant is flowering, the largest and deepest coloured being preferred. These are to be carefully dried in a warm room through which a current of air is passing, and when completely crisp and dry, are to be reduced to powder, and kept in bottles closely corked, and not exposed to the light. Particular attention is necessary in keeping the plant free from the access of air and moisture, but especially the latter. Too much attention cannot be paid to this circumstance. If the plant be permitted to remain in the open air for some months, especially where any dampness can affect it, it becomes totally inert, retaining indeed a bitter quality, but losing that faint poisonous effluvia, with which its medical efficacy seems connected. The same deterioration takes place from keeping the coarse powder in paper or in a bottle, which is often opened for use. It is to such inattention to its preservation, as much as to its indiscriminate application, that practitioners entertain very unsettled notions of its effects, and frequently complain of its uncertain action.

The dried plant well kept, will preserve its virtues for a considerable time, but as an uniformity of strength is desirable, and as all herbaceous plants gradually lose their medicinal properties, it will be right for the apothecary to prepare it afresh every year.

*The effects of Digitalis on the system.*—*Digitalis* is decidedly narcotic in its operation, and seems to possess an action more directly sedative than any other of that class, at the same time it exhibits properties peculiar to itself. It is still doubtful, whether the strongly depressing effects which it exhibits on the pulse are immediate and direct, or whether they are not the result of a primary excitement by the medicine. If this excitement does take



place, it is certainly very evanescent in its duration. When given in a full dose, it exhausts the powers of the body, lowers the pulse from 75 to 40, and even 30 pulsations in a minute, produces sickness, vertigo, dimness of sight; if the dose be very large vomiting is excited, and a greater degree of vertigo. A dose still larger puts an end to life.

Digitalis in its operation on the system, exhibits very striking properties, to some of which we are to attribute the beneficial effects derived from its use in diseases. One of these properties is a most surprising diminution in the strength, and especially the frequency of the pulse—a diminution which extends not only to the reduction of an inordinate vascular action to the bounds of health, but even to bring it to a most unusual and preternatural depression, and, if persisted in, finally to destroy life.

Under its use cautiously administered, a strong pulse of the usual or increased quickness, will frequently sink as low as 40 pulsations in a minute, and sometimes much less, without intermitting, and when reduced, the same effect may be kept up for many days, by a less dose than that which originally reduced it.

Digitalis in its operation upon the system, exhibits another remarkable effect, which is, that it may be given for a considerable length of time, without its producing any sensible action upon the system, when its powers become suddenly developed, and to such a degree as to occasion alarm for the life of the patient, and though it is discontinued, its effects will remain for several days, being, in this, similar to Mercury. A knowledge of this fact should put us on our guard, not to increase the quantity or frequency of the dose too rapidly.

Another peculiarity in the operation of Digitalis is, that it is influenced in its effects by the position of the body. This circumstance was originally noticed in the *Edinburg Medical and Surgical Journal*. In the first case which attracted notice, the pulse which was reduced to forty strokes in a minute, in the horizontal position, was in a sitting position quickened to 70, and to 100 by standing. The fact has been noticed several times, and is recorded by Drs. Hamilton and Beddoes, so that no doubt remains upon the subject.

Having thus stated whatever was necessary in the history and operation of this article, I shall proceed to its application in the cure of diseases; and first of its efficacy in Dropsy. Though this article was known in the *Materia Medica*, as one of some importance, yet it may be said to have been brought into notice by Dr. Withering in the year 1775. In the early part of that year his opinion was asked respecting the utility of a family recipe, in the cure of Dropsy, in which the Digitalis was obviously the most important in the compound. From the effects attributed to

it, he was anxious to make a trial of the remedy in this disease, and opportunities being presented, the success which attended his practice was so marked, that after investigating the properties of this plant for ten years, he gave the result of his experience in a very valuable treatise published in 1785. In this treatise, the importance and efficacy of this article as a diuretic appear to be fully established; and so sanguine was Dr. W. in his opinion of its efficacy, that he says, so far as the removal of the water will contribute to the cure of the disease, so far may it be expected from this medicine. A great number and variety of cases of dropsy in all its forms are detailed, and when the disease was unconnected with visceral obstruction and not encysted, great relief was always obtained, and in the majority of cases cures were effected.\* The state of the constitution must be attended to in its administration. Thus, Dr. Withering states decidedly, that it acts more favourably on a weak and lax fibre, where the œdematous limbs readily pit on pressure, and the complexion is pale and transparent—that it is less favourable in men of great natural strength, having a chorded pulse, florid complexion, and hard skin. Dr. McLean in his excellent work on Hydrothorax, has made some valuable remarks on the action of Digitalis. His opinions coincide entirely with those of Dr. W. respecting the constitutions that admit of most relief from it.

The signs, say they, which admit of its employment, characterize the strictly dropsical habit, and are, certainly, as they most truly assert, attendant on great feebleness of body, either natural or induced by disease. In this state of the constitution it will be found, they think, singularly useful, and when properly dosed, evacuates the water with less disturbance to the system, than any other diuretic.

In the consideration of this article in the treatment of dropsy, I shall notice its utility in the different forms of that disease. In doing this, I shall hope to revive something of its lost reputation, for surely an article which has received the unqualified commendation of Withering, Darwin, Beddoes, Ferriar, and Hamilton, must possess claims upon our attention. If the ancients entertained such an idea of the incurable nature of dropsy, as to call forth the remark of Aritæus, "*Ab ipso pauci liberanter, idque felicitate, ac deorum potius quam artis auxilio,*" how great should be our obligations to men, who, after a course of well conducted trials of a remedy, have assured us that under its use, dropsies, though always difficult to cure, are not yet the opprobria of our art.

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\*It is these complications which give to the disease its unmanageable and fatal character, and where they do not exist, a variety of remedies will be found quite as effectual as Digitalis, for the removal of the effused fluid.

Such would be our impression at least, upon rising from the perusal of Dr. W's. treatise, and though the discharge of the effused fluid does not always result in the curing of the patient, yet the diuretic operation of the *Digitalis* cannot be questioned.

*Digitalis* does not appear to be equally useful in all the forms of Dropsy. In Hydrothorax it is much less successful than when the disease exists in other parts of the body. I have on several occasions employed the medicine in these cases, and the benefit afforded was inconsiderable.

In Ascites it is doubtless a remedy of utility, and there is none, which in successful cases, effects a more rapid evacuation of the effused fluids. To produce this effect, however, regard must be had to the state of the constitution. When there is much activity in the pulse, and much general strength remaining, it will prove useless. These cases are best treated by antiphlogistic means. But in that kind of constitution described by Withering, when the pulse is feeble or intermitting, the countenance pale, the skin cold, it will frequently be found beneficial. One fact, however, is important to be known, that when it is favorable, relief is afforded early, and there is little use in persevering with the medicine longer than a week, if it does not discover its efficacy within that time. The manner in which *Digitalis* operates, as I have stated, in discharging the effused fluid, is not by stimulating the kidneys directly, to an increased secretion, (since it exerts no diuretic action on persons in health,) but that it influences the absorbents in such a manner as to enable them to take up the effused fluid and throw it into the circulation, from whence it is afterwards removed by the natural emunctories.

*Digitalis* has been employed with much advantage in Anasarca, which so often succeeds to Scarlatina. In this species of dropsy, *Digitalis*, Dr. Withering asserts, without reserve, is a sovereign remedy. In this form it has failed in no instance when properly exhibited, and Dr. Beddoes adds, without fear of contradiction, that it is equal to almost any emergency, short of that destruction of parts, which admits of no cure.

*Digitalis* has been said to be occasionally useful in diseases of the urinary organs, as Nephritis and Strangury. Dr. Withering recommends it, but its efficacy may be much questioned. It has but little relation to the kidneys, and acts exclusively upon the lymphatics, as I have observed, for it never promotes the urinary discharge, unless where dropsical effusions exist: thus it never proves diuretic in Pulmonary Consumption.

As the action of *Digitalis* is much influenced by the form in which it is administered, I shall observe, that to obtain its diuretic effect, it is best exhibited in the state of infusion, it acting in this way with more speed and certainty.



The infusion recommended by Dr. Withering, and which is that commonly employed, is one drachm of the dried leaves, infused in eight ounces of boiling water to  $\text{zvi.}$ , to which when strained  $\text{z i.}$  of any aromatic spirit is added. The dose of this infusion to an adult is  $\text{zss.}$  three times a day, till the desired effect follows, and the quantity may be gradually increased, by a drachm every day, unless the reduction of the pulse and the other symptoms arise to an alarming degree. To children, as after Scarlatina, it should of course be proportioned to the age, less than a drachm will often be sufficient, and it is of great importance to recollect that there is no circumstance in which constitutions vary more, than in their susceptibility to the bad effects of Digitalis.

In administering this article the following directions should be observed, that its use be continued until it either acts on the kidneys, the stomach, the pulse, or the bowels. When its effects are exhibited upon any one of these organs, it should be discontinued, and the patient will not suffer from its exhibition, nor will the practitioner be disappointed in any reasonable expectation. This is the language of Dr. W. When diarrhœa supervenes, or the medicine acts as a purgative, (I have known six or seven evacuations to be produced in the twenty-four hours, by the use of the tincture,) impeding the flow of urine and stopping its diuretic effects, its use should be discontinued.

Such are the principal directions and cautions to be pursued in the use of this article in dropsy. It is a subject upon which much has been written, and it has engaged the attention of some of the most distinguished men of our profession. Their researches have been pursued with ardor, and the results candidly detailed. From them we cannot deny to this substance great activity, and the power of relieving the distressing symptoms of dropsy. Why then, may I ask, have we such contrary opinions relative to its efficacy? They proceed, I would suppose, not from a desire to reject all medical testimony, but from inattention to the quality of the plant, its preparation, the kind of constitution to which it is best adapted, and the cautions to be pursued in its administration. With attention directed to these several points, we may be led to hope, that the encomiums bestowed upon it, may yet prove not unfounded.

When carried to the extent of affecting the system, either by the pulse, the stomach, bowels, or head, I have in several instances observed its diuretic operation exerted to a considerable extent, and, like other practitioners, began to be sanguine in my expectations of a cure. I have, however, been disappointed, and am convinced, that the effusion we call dropsy, is often only a symptom of greater derangement, of alterations in the organic structure, which while they continue, though the effusion may be removed,

yet it soon returns, and by exhausting the powers of life, by draining the vascular system, by injuring the texture of parts into which it is poured, by the confinement of the patient, and the anxiety he suffers, the case terminates fatally. Still we are not to abandon a patient under these circumstances, but approach the treatment with the use of means which may directly or indirectly be brought to bear on the case; and *Digitalis*, employed as directed, may prove useful. From these remarks I except the dropsies of children and young persons, which are often symptoms of other derangements, which will frequently yield to cathartics, mild diuretics, tonics, generous diet.

In using the *Digitalis* it must be given to the extent of affecting the system, and, for this purpose, the dose must often be carried to a great, and what we would at first suppose a dangerous extent. Beginning with 25 drops of the tincture, it may be carried to the extent of a drachm, or a drachm and a half, repeated 2, 3 or 4 times a day—it may be given to the extent of an ounce in the 24 hours—the same with the infusion.

*Utility of Digitalis in Hæmorrhages.*—Hitherto I have spoken of the utility of *Digitalis* as a diuretic. It is, however, useful in other diseases, from the remarkable property it possesses of reducing the force and frequency of the pulse. This, I need not inform you, is a property of no small importance, since by means of it, we are enabled to lessen the circulation without further evacuation. It becomes, therefore, a valuable acquisition, being often a substitute for the lancet, and sometimes even superior to it.

It is useful in all the Hæmorrhages, particularly Hæmoptysis and Menorrhagia, when its administration is properly directed. In the early stages of Hæmoptysis, when the pulse is active, the system full, and the general strength but little impaired, our confidence is better placed in venæ section and the antiphlogistic treatment, and this article should never be allowed to take the place of such remedies. After this treatment has been continued, and the inflammatory symptoms have been subdued, the pulse is often too frequent, and the circulation is so rapid, that if a coagulum is formed it cannot resist the impetus, but yields, and the hæmorrhage is renewed. Further, venæ sect. in this state of the system is forbidden, and *Digitalis* is one of our best remedies, for it never fails to lessen the circulation, and enable the vessel to contract. In other cases where Hæmoptysis occurs in delicate and irritable habits, attended with cough, pain in the side, and quickened pulse, *Digitalis*, with the use of blisters, and demulcents, is very usefully employed, and is given in such doses as just to affect the pulse, and keep it within the ordinary standard.

In uterine hæmorrhages, *Digitalis* has been said to be efficacious. But, here again, the state of the system and the circumstance

giving rise to the hæmorrhage, must be considered—and venæ sect., if required, must precede its use. I doubt, however, whether it is adapted to this form of hæmorrhage, as I once knew of a case in which the flow of blood was profuse during the operation of the medicine. This disease requires something to constrict the vessels, or produce contraction, and we have many remedies, as the Sac. Saturni, the decoction of Ergot, &c., which are better suited to this purpose.

In menorrhagia, which is often another form of uterine hæmorrhage, it cannot, or ought not to be depended on.

*Utility of Digitalis in Pulmonary Consumption.*—In this disease, this article has been much celebrated. By whom it was first employed is not exactly known—but from a knowledge of the properties of Digitalis, Dr. Darwin inferred its use in Pulmonary complaints. From the fears entertained of its effects when long continued, it urged its way with difficulty, until it was noticed by Drs. Drake and Fowler, the former of whom supposed that by its power of promoting absorption, and retarding the action of the arterial system, many of the symptoms might be mitigated and even cured. Accordingly in its application to a variety of cases, where the existence of Tubercles was indicated by every symptom, a full and fair trial confirmed the opinion which he had entertained.

Dr. Beddoes after expressing his full confidence in the utility of this article in the strongest terms, adds, that could a single auxiliary for foxglove be obtained, such as we have in many substances for Cinchona, he would not expect that two cases in five would terminate as ninety-nine in one hundred have hitherto terminated. He says, in fact, there is no stage of the complaint in which the great power of the plant to remove the disease, or mitigate its symptoms, have not been apparent in some instances, not even excepting the very close of the last stage.

Dr. Kinglake in his statement of the collective results of the effects of Digitalis, in this disease, says, “that where tubercles not ulcerated, have appeared to exist in the lungs, he could confidently aver that it has been, in almost every instance of such description, temporarily salutary, and often permanently curative. He conceives that in the incipient stages, where a hard dry cough attends—obstructed respiration—pain, more or less transient, in the chest—pulse small quick and hard—febrile heats and chills, with evening exacerbation of symptoms, the curative efficacy of Digitalis has been exhibited.

Dr. Fowler, in a letter to Dr. Kinglake, dated 1799, states, that subsequent experience with the Digitalis, gives no reason to think less favourably of its effects in consumptive cases. He mentions having cured two as severe cases as he ever remembers to have seen in an early stage.



Having placed before you the opinions of men, distinguished in the profession, as to the utility of *Digitalis* in Pulmonary Consumption, candour obliges me to confess, that present experience with this article, by no means entitles it to these high encomiums, and in proof of it, I remark, that Consumption is still a fatal disease, much so in our country, and still more so in Great Britain, where Dr. Heberden remarks, one-fourth of all the deaths are occasioned by it.

There are many pulmonary diseases bearing a close resemblance to Phthisis, in which this article has been employed, and success following its use, has caused it to be considered a remedy in this complaint. The wasting of the flesh which occurs in Phthisis is common to others, with the fever, pain, cough, thick expectoration, difficulty of breathing, &c.

These symptoms are often observed in violent catarrhs, as a consequence of pleurisy and other cases, in which the patient often recovers. In Consumption the action of disease is peculiar, and is different from the morbid action occurring in other parts of the body. It generally arises from tubercles, which are of a nature analagous to, yet different from scrofula, being very slow and tedious in their progress. This progress is sometimes completed, and the tubercle heals—but it is often succeeded by a multitude of others, which, in succession inflame and suppurate. It is this constant disease to which there is no end, that wastes the system, and renders the case incurable. Any treatment, to be successful, must have in view the removal of the local cause, and this, you will readily admit, cannot be effected by *Digitalis*. To suppose, that by the exhibition of a few grains of this vegetable substance, we can impart to the system a power, of which it is destitute ab origine, or that we can stay the destructive process which has commenced—to suppose that we can accomplish these objects by these means, is as futile as to pretend to hush the whirlwind, or direct the storm.

The singular property of lowering the pulse without increasing evacuation to any degree, renders it, however, particularly valuable in these cases. Hitherto this object has only been obtained by withdrawing a quantity of the circulating fluids, or by producing nausea. *Digitalis* is so far an invaluable remedy, as it enables the physician in most cases to accomplish this object.

With a reduction of the frequency of the pulse, relief is afforded to many of the distressing symptoms of the disease, as pain in the side, cough, dyspnœa, fever, and if the remedy is resorted to early, and proper attention paid to diet and exercise, much benefit will doubtless be derived from its use.

Even when the disease is more advanced, and from the feeble and irritable state of the patient, bleeding can no longer be em-

ployed, Digitalis, in such doses as keeps the pulse at a more natural standard, may be highly beneficial. But in the more advanced stages, when purulent expectoration, and its train of distressing symptoms exist, nothing under heaven can do more than palliate and smooth the avenues of death.

Many other diseases may be enumerated in which Foxglove has been recommended and employed, but those I have mentioned are the most important, and for which it has been chiefly celebrated.

In the Phlegmasiæ it has been employed, and is spoken favourably of by many. It ought only to be resorted to under the circumstances I have already mentioned, and after the proper exercise of antiphlogistic remedies. Even here, however, our efforts will be more successful by the use of such means as are better calculated to restore the secretions, than reducing arterial action simply. This, let it be recollected, is the important object to be kept in view, in the treatment of inflammatory affections and diseases generally, and we effect this better in the stage in which Digitalis may be employed by diaphoretics, diluents, blisters, small doses of mercury, &c.

*Forms of administering this article*—They are infusion, powder, and tincture.

The dried leaf is undoubtedly the strongest of these preparations, and would generally be entitled to a preference—but in an article of such activity, we prefer rather the means of accurately measuring the dose, than giving it in a very concentrated state.

When given in substance, the dose will be  $\frac{1}{2}$  to 1 grain of the powder in the form of pill, or mixed with any aromatic water. When the narcotic effect of the article is desired, as in Pulmonary Consumption, the powder or tincture is preferred. The tincture is prepared with  $\mathfrak{z}\text{i}$ . or  $\mathfrak{z}\text{ii}$ . of the leaves to a pint of spirits. The dose from 10 to 20 drops, two or three times a day.

The infusion is prepared as already mentioned.

In employing Digitalis it is necessary to be cautious. Sometimes notwithstanding all our care, symptoms of an alarming nature come on, not necessary to the beneficial action of the medicine, and which are the signal for its immediate discontinuance. These are retardation of the pulse, palpitations, faintness, sickness and purging. There is likewise a membranous tensive pain of the head, sometimes over one eye, with a disturbance of the functions of the brain, which occasionally attends an over dose, before any other bad signs have appeared. When any of these symptoms occur, the medicine must be omitted.

The sickness excited by this medicine is different from that occasioned by any other—it is peculiarly distressing to the patient—it ceases, it recurs again as violent as before, and thus it will con-

tinue to recur for three or four days, at distant and more distant intervals.

When the symptoms run high, and the poisonous operation of the medicine is exhibited, they must be corrected. The correctives will consist of an emetic, if the degree of prostration does not forbid it. *Æther*, volatile alkali, brandy and cordials are necessary—Synapisms and blisters are also very important.

With these remarks I complete the consideration of an article powerful in its effects, varied in its character, but often uncertain in its operation.

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*Family Solanæ—Nicotiana Tabacum.*—Closely allied to Digitalis in its structure and effects, is this article. Its natural history having been detailed, and some of its properties pointed out, I shall only make a few observations upon its diuretic operation.

To Dr. Fowler we principally owe much that is known upon the diuretic action of this article. His work upon this subject, entitled Medical Reports upon the effects of Tobacco, was published in the year 1785. In it, he speaks, with the usual extravagance which characterize those who are patrons of particular articles, and says, that out of one hundred and fifteen cases, in which he administered the Tobacco, in ninety-three of them it proved diuretic. He further adds, that in thirty-one dropsical cases, in which he employed it, thirteen were cured, and ten relieved.

Subsequent writers have spoken of it. Dr. Ferriar and several other practitioners have found it valuable, though Dr. Cullen does not speak very encouragingly of its use.

Dr. Garden, a distinguished physician of this city, spoke of the great efficacy of the Alkaline Salt of Tobacco in dropsies, and from this hint, which was communicated to Dr. Hope, in a letter, Dr. Fowler was first induced to make trial of the article.

Upon the faith of these recommendations, I have employed the Tobacco in a few cases of dropsy. From the small doses that are proper to begin with, hardly any diuretic effects have been observed to follow, and though from larger doses they have in some measure appeared, it has seldom been considerable, and when to obtain these in a greater degree, the doses have been increased, it has usually been necessary to lessen the quantity, by the severe sickness at the stomach, and even vomiting which was occasioned. So that I may say, we have much to learn in the administration of the remedy, so as to render it certain and convenient in any cases of dropsy.

These objections to the use of the article, I have obviated, by commencing with a small dose, and increasing a drop every dose, until some sensible effect was produced. Thus administered, I



have been much pleased with its effects in the cases in which it was employed. Commencing with 20 drops, three times a day, the quantity has been increased to 60 drops three times a day, with effects very decided upon the urinary secretion, from two to three quarts being frequently discharged during the night. The bowels were also kept open by the same—and where there is no organic injury, it may be considered a remedy in dropsy, as its diuretic operation is very considerable.

From the uncertainty which attends the operation of diuretic medicines, it is proper that we should make trial of a greater variety in dropsical cases than it is usual to employ, with the hope that we may find some one more efficacious than the rest. With this view I have introduced this article to your notice, since it has been said to have been efficacious after a variety of others had been employed. Should it therefore be necessary to resort to it, it is best given in the form of infusion or tincture, prepared in the following manner:

℞. Dried leaves of Tobacco, ℥i.

Water, ℥xiv.

Spirits of Wine, ℥ii.—digest for a week.

The dose for an adult, sufficient to produce the diuretic effect, is xx. drops three times a day, increasing a drop every dose, until some sensible effect is produced.

It may also be given in the form of a saturated vinous tincture. The dose the same.

In this manner the quantity given may be extended to 60 or 100 drops. The medicine will be found not unfrequently to disagree with the stomach, when taken in the morning fasting, and even to produce vomiting, but no material disadvantage arises from this circumstance. The same doses can commonly be taken in the evening without any inconvenience.

In administering this medicine it deserves particular notice, that between constitutions which are very nervous and irritable, and those which are very robust, or torpid, or long accustomed to the use of Tobacco, the doses will admit of great and surprising variations.

In Chronic Catarrhs, Phthisis Pulmonalis, and other chronic diseases of the Lungs, it is an article more to be relied upon than Digitalis. It may be given in the same doses, 10 to 20 drops, several times a day in a little water.

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*Family Colchicææ—Colchicum Autumnale—Meadow Saffron.*—The root, the part employed in medicine, is perennial, bulbous, and covered with a brown membranous coat. It is a native of England and of the continent of Europe, growing in meadow grounds of a rich soil and flowers in the autumn.

*Description of the Plant.*

Root bulbous, nearly as large as the tulip, fleshy, abounding in a milky juice, perishing after the ripening of the seeds.

Flowers generally purplish, opening the latter end of September, without stem or leaves; tube of the corolla very long, segments of the calyx lanceolate, large.

Anthers yellow, germ remaining under the ground during the winter.

Leaves appearing the ensuing spring, a foot long, broad, flattish, obtuse, dark green.

Writers differ much in their opinions respecting the effects and sensible qualities of the roots. By some it is stated to be void of taste and acrimony, and that considerable quantities may be taken without any inconvenience, except that of an ungrateful bitterish taste. Baron Storck, on the contrary, tells us, that by gently rubbing the root against the tip of the tongue, it renders the part rigid, and almost void of sensation for several hours. These contradictory statements can only be reconciled, by supposing the roots to vary much according to age, the soil in which they grow, and probably still more the season of the year in which they are dug up. The roots, therefore, should be taken up by the middle of summer for medicinal purposes, since they become nearly inert while producing their flowers.

From this article an alkaline principle has been obtained, to which the term of Colchicine has been given. It is an extremely active substance, 1-10 of a grain, dissolved in alcohol, was given to a cat six weeks old. The animal began at once to foam at the mouth, in the course of an hour passed abundant alvine evacuations, attended with vomiting—became feeble, unable to walk steady, was agitated with convulsive motions and the symptoms increasing in severity, it died in twelve hours. Upon examination, the intestinal canal was found highly inflamed, and blood effused into its tissue throughout its whole extent.

For the introduction of the recent root of this plant into the *Materia Medica*, we are indebted to Baron Storck, who first thought of converting this acrid poison to the purposes of medicine. It was introduced by him as a diuretic, and was employed with much benefit in the Hospital of Vienna in dropsical cases. He employed it in the form of an oxymel, prepared by digesting

The recent root sliced, ℥i.

Vinegar,

℔i. for 48 hours, with a gentle heat.

The vinegar being then strained and mixed with twice its weight of honey, and boiled to a proper consistence, formed an oxymel, which taken twice a day in doses of a drachm, and gradually increased to an ounce or more, proved beneficial as a diuretic, and in many cases cured dropsies which had been esteemed desperate.

It is still a popular remedy in Germany and France—but in this country it has not been found very efficacious, certainly not more so than the Squills.

Since the time of Baron S. the uses of this medicine have been much extended, and it has become a very interesting article of the *Materia Medica*. The preparation he employed has been superseded, and in place of it the Wine of Colchicum substituted, and this is the form in which the article is most commonly administered. The following is the method of preparing it.

Take of the fresh root sliced,  $\text{ziss}$ .

Madeira or Lisbon Wine,  $\text{ʒxii}$ .—digest for 2 or 3 days and filter through paper.

Most of the preparations of this article are objectionable, the quantity of the ingredients varying considerably—in some instances a pound of the sliced root to 12 ounces of wine. The formula I have given is best.

The Colchicum Wine has been employed in Dropsy, and the reports of its use are more favourable than with the oxymel. It was employed in a woman labouring under ascites and anasarca in the dose of 200 drops in the morning, and the effects produced were copious watery discharges. The medicine was continued in the same dose for nine days, in which time the dropsical swellings had entirely disappeared, and the cure was completed by the administration of tonics.

In my trials with this article I have found the dose above directed too large, much less quantity acting with considerable energy. Given in doses of from thirty to forty drops three times a day, free catharsis was induced, from twelve to twenty passages being produced in the 24 hours. In this manner it appeared to reduce the swellings in the instances in which it was employed. It is also to be remarked that its action upon the bowels continues several days after its use has been suspended.

It is, however, in other forms of disease that the Colchicum Wine has been recommended, and with more advantage than in dropsy. These are Gout and Rheumatism.

The former disease possesses a considerable connection with the state of the alimentary canal, and it has been very successfully treated by very free and copious evacuations. To a person labouring under an attack of gout, it is given in a dose of 200 drops at bed-time. Sometime after taking it, there usually follows considerable relief to the violent pains which existed, and sleep commonly ensues. In the morning a severe purging of black foetid matter takes place with nausea, and a profuse diaphoresis. With the removal of these symptoms, the disease has, in a great measure, subsided, and in some instances completely disappeared, inasmuch that patients have been able to follow their usual occupa-



tions within two or three days, without the least symptoms of the disease. Upon this subject I cannot speak from experience, but the most respectable authorities may be adduced in support of its utility. This tincture has been said to bear considerable analogy to the Eau Medicinale du Husson, which had acquired considerable reputation in the treatment of gout. It was discovered about half a century ago, by a French officer, M. Husson. It is a vinous tincture, resembling ale in its appearance, is nauseating and bitter and has the smell of Spanish wine, and some plant. What the composition is, has not been ascertained, though various conjectures have been formed on the subject. The Colchicum Wine bears a very strong analogy to it, in its operation and effects, and from these circumstances the supposition is rendered very probable that it is the chief ingredient in the composition. For an account of the utility of Colchicum in gout, I refer you to a note in Chapman's Therapeutics.

From the utility of Colchicum in gout, its use has been extended to the treatment of rheumatism, and other painful affections, and the reports in its favour, are, upon the whole, very favourable. The form in which its administration is recommended in that disease is a tincture of the seeds, prepared in the following manner.

R. Seeds of Colchicum Autumnale, ℥ii.

Spanish Wine, ℔i.—digest for eight days and strain. The dose is xx. to xxx. drops increased to ℥i. once or twice a day.

The efficacy of this formula has been commended in high terms by Dr. Williams, of Ipswich, Eng., and though I cannot consider it entitled to the consideration of a specific, which some practitioners have thought, yet, in this disease, it is allowed to have a decidedly beneficial operation, removing the symptoms in a short time. The remedy has been employed by several physicians of this city, and though in the acute attacks of this disease it can seldom be relied upon alone, yet after bleeding and other depletives have been premised, it may be given with much benefit.

Dr. Armstrong has spoken in terms very favourable of the use of this article in rheumatism, and considers it capable of giving more speedy and decided relief than any other single remedy which he has employed. He considers it, however, useful as an adjunct, and recommends it after inflammatory action has been subdued. When thus employed it will be found to reduce the action of the heart, to lessen animal heat, and to abate pain.

By Mr. Haden, of London, it has been employed in the treatment of inflammatory diseases, acute as well as chronic. He recommends it as a remedy possessed of considerable power in overcoming inflammatory action, so as to become a useful auxili-

ary to the lancet, and in some instances of peculiar idiosyncrasy to supersede its use. The practice of the author in pneumonia, catarrh, and some other diseases is detailed, and there can be no doubt, that from its effects upon the bowels, it may be so managed as to diminish the force and frequency of the pulse, to allay pain, and other symptoms of inflammation, and in certain cases to fulfil the object of depletion by the lancet. Yet in many of these cases it may be questioned whether bleeding would not have cut short the severity of the symptoms, and aided the Colchicum in subduing the disease.

The dose is  $\mathfrak{z}\text{i}$ . night and morning in the more violent cases, and  $\mathfrak{zss}$ . in those of a less severe character, until the pain and fever are abated.

The dose of the oxymel is  $\mathfrak{z}\text{i}$ .

• Of the Wine of Colchicum, xxx. to xl. drops

Tincture of the Seeds, xx. to xxx. drops

Externally the tincture is employed as a liniment in rheumatism. In an affection of the deltoid muscles from this cause, relief was afforded in a few hours. One or two tea-spoonsful to be rubbed at a time upon the part.

The tincture of the seeds may also be employed in the same manner. The case of a clergyman is related who was confined to his bed for a month or six weeks from rheumatism, and who was able to leave it on the fifth day after friction with the tincture of the seeds.

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*Veratrine*.—Upon this alkaline principle, obtained from the root of the Colchicum Autumnale, and the roots of the Veratrum Album, and the seeds of the Veratrum Sabadilla, a few remarks may be made.

The family of the Veratrum, or Hellebore tribe has long been known in the Materia Medica, and is remarkable for its extreme activity when applied to the human system, producing, even in small doses, violent vomiting and purging, hypercatharsis, with bloody stools and tenesmus.

The experiments of Pelletier and Caventou, made in 1814, have discovered in these plants a salifiable base, to which the term Veratrine has been given, and to which is owing their extreme activity and dangerous character.

The manner in which it is separated from the plants which contain it, will not interest you, and moreover will be explained to you by the Professor of Chemistry.

Its appearance and properties are as follows. It is a white crystalline powder, without any bitterness, but of extreme acrimony, causing, when taken into the mouth, a profuse salivation, without any sensible odour, yet occasioning violent sneezing. It is

sparingly soluble in water, but soluble in alcohol. It is placed by Orfila among the narcotico acrid poisons, and in very small doses acts as a violent local irritant. In the dose of a  $\frac{1}{4}$  of a grain of the acetate of Veratrine, it induces copious evacuations from the bowels, and in doses a little larger, violent vomiting. In still larger doses it agitates the nervous system in a remarkable manner, producing all the symptoms of a violent tetanus, which is promptly fatal. Externally applied it produces none of the symptoms which follow its internal administration, but appears to assuage pain, and diminishes internal nervous excitement, but without acting upon the intestinal canal.

*Diseases in which it is employed.*—Owing to its acting upon the nervous system, and especially on the spinal marrow and the nerves connected with it, it has been employed in the diseases of this system, as in Neuralgic affections, in Tic Douloureux, paralysis, &c. In these cases it has been experimented with by Magendie, and afterwards by Andral. Bardsley of Manchester, and Turnbull have both written upon it. In Neuralgia, the external use of the ointment, made in the proportion of a scruple of the salt to an ounce of lard, succeeded in removing the disease, which had baffled all other modes of medication.

Many cases are related of its efficacy in partial palsy, affecting different parts of the body.

It has also been employed in cases of chronic rheumatism, and is by Turnbull recommended in affections of the heart.

He has observed from the internal use of Veratrine, as well as from its application to the pit of the stomach, a diminution in the frequency and force of the pulsations of the heart, and in cases where it was more excited than natural, restoration of a regular circulation.

*Mode of administering.*—Veratrine may be given in pills, or in spirituous solution—the dose being from the 1-6 to the 1-12 of a grain several times a day.

Pills of Veratrine:

℞. Veratrine, g. ii.

Powdered Liquorice Root, grs. xii.

Ext. Hyosciam, g. vi.—mix and divide into xii. pills, one to be taken three times a day.

Tincture of Veratrine:

℞. Veratrine, g. ii.

Spirits of Wine, ℥i.—m.

15, 20 or 25 drops in a glass of water, 2 or 3 times a day.

Ointment of Veratrine:

℞. Veratrine, ℥i.

Lard, ℥i.—The size of a hazel nut to be rubbed carefully in morning and evening or oftener, for from 5 to 15 minutes.

—*Dunghlison's New Remedies.*



## INDIGENOUS DIURETICS.

I shall conclude this class with an account of several native articles which exert a considerable diuretic operation. The first is the

*Family Irideæ—Iris Versicolor, or Blue Flag.*

Root thick and creeping.

Stem 3 feet high.

Leaves ensiform.

Flowers in a terminal raceme, 2 to 4 in number.

It is found throughout the United States, in the borders of swamps and wet meadows.

There are several species or varieties of this plant to be found, but they are all nearly allied in their properties. The root is the only part used, it has a nauseous taste, and when held in the mouth or swallowed, even in small quantities, it leaves behind a powerful sense of heat and acrimony in the fauces. These effects are derived from an acrid juice, which exists in the roots in considerable quantity, and which, when expressed, has been esteemed as a local application in several diseases.

The Iris is possessed of cathartic properties, and is in much repute with the Indians. But though pretty certain and active in its operation upon the bowels, it is attended with many inconveniences. It is apt to occasion a distressing nausea, like sea sickness, with a prostration of strength of some hours duration, insomuch that it will never be employed for this purpose when others can be obtained.

It is, however, more particularly for its action upon the kidneys that it is entitled to your attention, and its powers in this respect are by no means inconsiderable. It was held in much estimation by the late Dr. McBride, and employed with great advantage in dropsy. It is given in the form of decoction, in combination with the root of the *Eryngium Yuccifolium*, or Button Snake Root, in the following proportions :

R. Root of the Blue Flag, ʒi.

Button Snake Root, ʒii.

Water, lbiss.—boil to one pint.

This quantity taken daily in divided doses.

The remedy is persisted in as long as any swelling remains, and the doses are increased or diminished according to the effect produced on the urinary discharge, which is generally very considerable. The decoction, prepared as directed, seldom or never disturbs the bowels, as might be supposed from the reputed character of the Iris as a cathartic—but when the proportion of the *Eryngium* is increased, it acts as an emetic.

Several gentlemen of this city, bear testimony to the good ef-

fects of this plant combined, as a diuretic. In some very severe forms of dropsy, which really appeared hopeless, the proper employment of the decoction was attended with the happiest effects, the health of the patients upon whom it was tried, having been perfectly restored.

A gentleman of this city has communicated to me two cases of dropsy, in which the efficacy of this article was exhibited. They were cases of ascites combined with anasarca, the disease having continued some time. One of the cases after having been submitted to a variety of remedies without any advantage, was finally nearly abandoned as irrecoverable. In this situation he was fortunately visited by Dr. McBride, who, from frequent trials of the Iris, was much prepossessed in its favor. A decoction was prepared in the proportion of an ounce of the root to a pint of water, to which was added a small portion of the *Eryngium Yuccifolium*, and this quantity was drunk daily. A few days after commencing the use of this drink, the urine was increased in a considerable degree, and the patient finally recovered.

The other case also recovered.

It is worthy of being remarked that no change had been made in the situation or habits of the first patient, but that placed under the same circumstances, in which the former treatment had failed, he seemed to have been restored by the unaided influence of the decoction. I should notice further, that in the part of country where Dr. McB. practised, the more intelligent part of the inhabitants to whom he communicated his views and practice, are still in the habit of employing this article, and appeal to it in severe cases with much confidence.

Dr. Bigelow has employed a tincture of the Iris in small doses with several persons affected with hydrothorax and anasarca. It was evidently, he says, of great advantage to a majority of those who took it for a certain time. That it did not cure the disease, is a reproach which it must share with diuretic remedies of much older celebrity.

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*Family Umbelliferæ—Eryngium Aquaticum vel Yuccifolium—  
Button Snake Root.*

Root tuberous and premorse, or bitten off.

Stem 3 or 4 feet high.

Leaves 12 to 18 inches long, 1 to 1½ inch wide, sword-shaped, fringed with soft spines.

Flowers capitate.

This plant is a native of the Southern States. The root, the part used, is to the taste, pungent, bitter and aromatic. When chewed it very sensibly excites a flow of saliva.

Its medicinal properties are diaphoretic, expectorant, and

sometimes it proves emetic. It is preferred by some physicians to the Seneca Snake Root, which it greatly resembles in its effects. It is also possessed of diuretic properties equal to those of the above, and as I observed, was much esteemed by the late Dr. McBride, in combination with the Iris in the treatment of dropsies.

In the form of tincture it may also be employed in these cases, and from the valuable qualities which it possesses, might be advantageously resorted to, when more active means have failed. I have been assured by a gentleman who made this article the subject of an inaugural dissertation, that the saturated tincture, rarely failed to excite a diuretic action in several cases of dropsy in which it was employed. Some of the cases recovered under its use.

The dose of the tincture is a tea-spoonful 3 or 4 times a day, increased according to circumstances.

This article is a popular remedy in some of the stages of dyspepsia.

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*Family Ericineæ—Pyrola Umbellata—Winter Green—Bitter Sweet—Pipsissewa.*—This article which has lately come into repute as a diuretic, is to be found in most parts of the United States. It grows in shady woods, where it is protected from the sun, and nourished by the peculiar soil formed from the decomposition of leaves and wood.

*Description of the Plant.*

Root woody and creeping.

Stem 2 to 4 inches high.

Leaves grow in irregular whorls, from one to four, evergreen, coriaceous, wedge shaped, serrate, smooth, shining.

Flowers in a small corymb.

Every part of the plant is employed and is possessed of considerable activity. The leaves when chewed communicate to the mouth a taste which partakes of both sweet and bitter, the stalks and root possess the same taste, combined with a moderate degree of pungency. By whom this plant was introduced into notice is not known, and it is probable one of the remedies which we may be considered as having derived from the Indians. The Hurons and other tribes, are well acquainted with the operative effect of the *Pyrola*, and have long been in the habit of using it in all disorders, which they ascribe to diminished secretion of urine, or which they think may be cured by an increase of that secretion.

Within the last ten years, attention has been attracted to it in dropsical affections, and the reports of its utility in exciting a copious secretion of urine, are very satisfactory.

Dr. Summerville, in a very interesting paper in the *Medico*



Chirurgical Transactions, has given an account of a case, in which after the trial of a variety of remedies, both cathartic and diuretic, and in which the operation of tapping had been twice submitted to, a strong infusion of the *Pyrola* was resorted to in the quantity of a pint in the twenty-four hours. Although the case was altogether an unpromising one, yet the plant gave great relief, not only in the first but in the subsequent instances of its use. It increased the discharge of urine, and at the same time produced an augmentation of strength and an invigorating appetite. Its influence on the kidneys was apparent in two days, for the quantity of urine discharged in twenty-four hours amounted to two pints, and was soon increased to three, and occasionally to four pints. A decided effect was produced upon the stomach, which had not been looked for, viz. an augmentation of its tone, with an increase of appetite. The strength improved daily, the countenance became less sallow, and the abdomen did not begin to fill for several weeks after the second operation. Although the case terminated unfavourably, the good effects of the *Pyrola* were manifested, and its utility in dropsical cases confirmed by the highest authorities. To remove the fluid, by the effusion of which dropsy is characterized, is not to cure the disease, of which the fluid, preternaturally accumulated, is in so many cases only a symptom, or remote effect—but since that is often the only relief we can aim at, it will readily be acknowledged, that the *Pyrola* will be entitled to the consideration of a useful article—since it not only increases the secretion of urine and retains its influence on the kidneys for sometime, but it occasionally acts as a tonic, and is in all cases free from those offensive and deleterious qualities which frequently interdict the application of some of the most powerful diuretics.

The *Pyrola* is used in the form of a strong infusion of the whole plant, in the quantity of a pint daily. Prepared in this manner, the medicine is nearly of the colour of the infusion of green tea, its taste being agreeably bitter.

It may also be used in the form of a decoction. An ounce of the dried plant including the roots, stalks and leaves cut small, and macerated twelve hours, in two pints of cold water, then boiled until it yielded a pint of strained liquor, was found to act with greater energy than the infusion.

Besides dropsy, this article is employed in several of the diseases of the urinary organs,—in Ischury, Dysury, and in Nephritis Calculosa. Its operation in these cases exhibits a considerable analogy to the *Uva Ursi*.

Externally it has been used as a stimulant in various cases. As a wash it has been employed in several species of ulceration with considerable success—and at one time possessed some repu-

tation as a remedy in the cure of cancer. Of its efficacy in real cancer we require more evidence than is at present possessed, before we can ascribe to it the power of controlling so formidable a malady.

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*Pyrola Maculata*—*Spotted Winter Green*.—Possesses properties similar to the foregoing, being tonic and diuretic, and resembles in its effects the *Arb. Uva Ursi*.

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*Family Aloideæ*—*Aletris Farinosa*—*Star Grass*.

Root tuberous and perennial.

Leaves all radical, expanding, lanceolate, and in consequence of their being spread out close to the ground in a radiated manner like a star, the plant has received the name of Star Grass.

The stem is from one to three feet high, upon which the flowers form a slender scattered spike, with very short footstalks.

It grows in most parts of the United States, in fields about the edges of woods, being chiefly found in damp pine barrens. In its general properties it is allied to the preceding article. It is exceedingly bitter, and from this circumstance has been used in those cases in which articles of this description are employed. Infused with vinegar or spirits, it has been employed in Intermittents attended with dropsical swellings, and with good effects.

It is more particularly as a diuretic that it requires consideration, and for this purpose it has been much used by the common people in dropsies. It is given in the form of a decoction of the root and leaves, and in pretty liberal doses, alone, or combined with various articles. It is not unpleasant, and in general it agrees well with the stomach. I have used it in this manner in two cases. In the first in which it was tried the flow of urine was increased. In the other no change was produced, but upon examination after death, such a mass of disease was exhibited, that no article with which we are at present acquainted could have afforded relief.

The usual form of administering it, is in decoction in the proportion of  $\frac{3}{4}$ ss. of the root and leaves, to a pint and a half of water, simmered for a short time. The dose as much as the stomach will bear. There are few popular articles which in this country have a more extensive reputation.

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*Erigeron Heterophyllum*—*Sweet Scabious*—*Flea Bone*.—As this species does not grow in our State I need not dwell upon it.

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*Achyranthes Repens*—*Forty Knot*.—This is a perennial creeping plant.

Stem very hairy, and villous at the joints.

Leaves slightly sprinkled with hairs on the under surface, opposite, one leaf generally larger than the other, lanceolate, petiolate.

It grows in dry soils, along fences, walls, the edges of roads, streets, and in places much trodden.

Its diuretic properties are often considerable, and in patients labouring under Ischury and Dysury, it has been employed with considerable advantage. These complaints are of frequent occurrence in old persons, and are caused by small calculi or gravel irritating the neck of the bladder, or lodging in the urethra. Diuretics are useful under these circumstances, by distending the bladder, and by the dilatation the urethra undergoes, the calculi are often expelled. The expulsion is much aided by pressing upon the urethra, so as to allow of greater distension, when the proper efforts being used to evacuate the bladder, the irritating substance is often expelled.

It is even extended to the treatment of dropsy, and in a case which occurred at one of the public institutions, its use was attended with much advantage.

A decoction of the whole plant is employed, in the proportion of a handful to a pint and a half of water, simmered for a short time. It is given warm, and usually in as large doses as the patient can take. Its operation is promoted by the addition of any of the Saline Diuretics.

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I have thus presented you with a pretty large collection of our native plants. They are well adapted to those cases of dropsy occurring as a consequence of fever, and in debilitated habits generally. In these cases I believe they will be found more useful than many of the articles of the *Materia Medica* upon which dependence is at present placed. Combined as most of them are with considerable tonic properties, they are well adapted not only to contend with debility, but to promote the absorption and evacuation of preternatural collection of fluids.

In dropsies occurring in constitutions labouring under visceral obstructions, or as a consequence of a broken and dilapidated constitution, these, with others, will be found alike inefficient.

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Besides the articles I have mentioned, there are a variety of others which are much employed in domestic practice for the purpose of promoting the urinary secretion, as the leaves of the *Cynara Scolymus* or Artichoke, bruised and steeped in gin, and taken in pretty large doses during the day.

The root of the *Cochlearia Armoracia* or Horse Radish taken in the form of a strong infusion was recommended by Dr. Sydenham in those dropsies which succeed Intermittent Fevers, and



in old persons. In ardor urinæ the infusion is usually employed as a diuretic.

The *Semina Sinapi* or Mustard Seed, unbruised, and taken in the dose of a tea-spoonful two or three times a day, sometimes prove considerably diuretic.

Lastly, the *Aliaceæ* have been much employed.

The expressed juice of the Garlic and Leek, has at different times been recommended as diuretic.

With these, I complete the consideration of the articles of this class.

I have presented you such as are most approved, and in doing so, have not hesitated to express my own opinions after some experience with them. Of the degree of importance to be attached to these opinions, you will hereafter be the judges. I cannot, however, conclude, without again reminding you of the general uncertainty of the class—sometimes the more feeble will succeed when the stronger have failed, and often after every variety of kind and combination has been tried, the secretion of urine remains unaltered.

The following principles will give us a very good idea of the extent of operation of this class of medicines.

1. Dropsies produced by an obstruction to the circulation, yield to bleeding and gentle diuretics, provided the cause of the obstruction is not incurable. *Digitalis* is useful when this obstacle is hypertrophy of the heart.

2. Dropsies produced by the sympathetic influence of a chronic phlegmasia, are rarely curable, because such phlegmasia seldom occasion dropsy till the seat of the phlogosis is changed in its structure. The treatment must be directed solely to the chronic phlegmasia, and the diuretics such as do not irritate the digestive organs.

3. Dropsies which depend on an accidental defect in the urinary or perspiratory secretions or excretions, will yield to the establishment of these by the proper means. Diuretics and even purgatives will cure them, but we must take care to remove the accompanying vascular plethora, and not to exasperate the phlogosis which may co-exist.

4. Those dropsies which result from bad digestion and assimilation, disappear under the influence of tonics, good air and good aliments.

5. Dropsies resulting from hæmorrhages, or other evacuations are cured by tonics, good food and active diuretics—but we should be cautious in such cases of too suddenly restoring the strength.

—*Broussais*.

In dismissing this class of medicines, I am, by an intimate con-

nection, led to consider the morbid condition of the urinary secretion, and to take a brief view of those medicines, the object of which is to correct or obviate them. I shall therefore proceed to the Lithontriptics and Antilithics.



## DIVISION VIII.

### LITHONTRIPTICS AND ANTILITHICS.

THE term Lithontriptic has been used to designate a class of medicines, supposed to possess the power of dissolving stone in the bladder, and the term Antilithic to a class of medicines capable of correcting the lithic diathesis, or that state of the constitution favorable to the production of calculi. Both terms are doubtless correct, and the propriety of retaining them will appear obvious.

The nature of the urinary secretion has been the subject of much investigation, both on account of its supposed connection with many diseases, and on account of the very singular products which have been obtained from it. From an analysis, which has been made by several chemists, it is found to consist of various acids and salts, in its healthy state, and from the predominance of a few, or their varied combination, the varieties of human calculi are derived.

These several principles are—

1. Phosphoric Acid.
2. Phosphate of Lime.
3. Phosphate of Magnesia.
4. Carbonic Acid.
5. Carbonate of Lime.
6. Uric Acid.
7. Albumen and Gelatine.
8. Urea.
9. Muriate of Soda.
10. Phosphates of Soda and Ammonia.
11. Muriate of Ammonia.

With other salts according to the state of health or disease.

Upon a few of these substances I shall make some remarks.

It is known to most of you, that Phosphorus for a long time was principally obtained from urine, and it was from Mr. Boyle and other chemists, whose exertions were principally directed towards improving the method of obtaining this substance, that our knowledge of the other component parts of urine has been derived. These researches have been carried to a great extent, by Scheele, Cruikshanks and others.

Uric Acid also exists in considerable quantity, and is discovered when the urine cools, by its letting fall a brick coloured sediment, which Scheele first ascertained to be the crystals of Uric Acid. It exists in all urine, though no precipitate be formed when it cools.

Albumen and Gelatine are present, and are detected by dropping an infusion of Tannin into urine, when a whitish substance is thrown down. It is to these substances that the appearance of cloud as it is called, or the mucilaginous matter which is sometimes deposited as urine cools is owing. In many diseases the quantity of these matters is much increased, and Fourcroy observes that in all cases of impaired digestion, the albuminous part of urine is much augmented. It forms one of the most conspicuous and important distinctions between the urine of those who enjoy good and bad health, and upon their existence, Blackall has founded his distinctions in dropsy.

Urea—From this substance the taste and smell of urine are derived. It characterises urine, and constitutes it what it is, and to which the greater part of its very singular products are to be ascribed. According to Fourcroy the colour of urine depends upon the Urea—the greater the proportion of Urea, the deeper the colour.

The various salts are discovered by evaporating the urine to the consistence of syrup, when a number of crystals appear.

Such being the nature and composition of urine, it may be supposed that when the quantity of these substances is augmented beyond what can be held in solution, urinary concretions or calculi would be formed.

Particular states of the constitution give rise to the formation of these ingredients, and when carried to excess is called the lithic diathesis. Of this state of the system I shall say nothing at present, but as calculi have been divided into different classes, according to their chemical composition, I shall give a description of them, briefly mentioning the several substances which act as their solvents. By pursuing this course I may be considered as reconciling the contradictory statements which have been made relative to the solvent powers of medicines, and of drawing aside the veil that has so long obscured the history, origin and cure of calculous diseases. It is to chemistry we are indebted for these important results, since it has demonstrated that these calculous substances vary in composition, and are consequently differently affected by the same chemical agents. We must consider these cases as some of the few in which chemical principles have been successfully applied to the treatment of diseases—since the only rational observations which have been given to the public, have originated with chemists or chemical physicians. Upon this account it will be proper to enter into the chemical history of the



different calculi, and by exhibiting the structure, we may determine upon the solvent best adapted to it, thereby divesting these diseases of much of the uncertainty and empiricism formerly attached to them.

The different substances which enter into the composition of urinary calculi, may be arranged under the following heads.

1. Lithic or Uric Acid.
2. Phosphate of Lime.
3. Ammoniac Magnesian Phosphate.
4. Oxalate of Lime.
5. Cystic Oxyd.

Besides others produced by the combination or admixture of these ingredients.

1. Lithic Calculus.—It is a hard inodorous concretion, of a brownish or fawn colour—sparingly dissolved in water, from which in cooling it separates in small yellowish particles. It is easily dissolved by solutions of the fixed alkalies, and is insoluble in the muriatic or sulphuric acids.

2. Bone Earth Calculus, or Phosphate of Lime.—This is of a pale brown colour, and is so smooth as to appear polished. When sawed through it is found very regularly laminated, and the laminæ generally adhere so slightly to each other as to separate with ease in concentric crusts. This species of calculus dissolves without difficulty in the muriatic or nitric acids.

3. The Triple Calculus, or Ammoniac Magnesian Phosphate.—This is generally whiter and less compact than those of the former class. The crystals of this calculus are readily dissolved in most if not all the acids.

4. Mulberry Calculus, or Oxalate of Lime.—This calculus is thus named from its external resemblance to the mulberry—it is readily dissolved in muriatic or nitric acids.

5. Cystic Oxyd—This species of calculus is of rare occurrence, and was first discovered by Dr. Wollaston in 1810. It is of a compact structure, and does not consist of distinct laminæ, but appears as a mass confusedly crystallized. It is dissolved by the several acids and all the alkalies.

6. The last that I shall speak of is the Fusible Calculus.—It is commonly whiter and more friable than any other species. It sometimes resembles a mass of chalk, leaving a white dust on the fingers, and separates easily into laminæ or layers. Calculi of this description acquire a very large size, and are apt to mould themselves in the contracted cavity of the bladder. It is dissolved by the sulphuric or muriatic acids. It is a compound of the second and third species of calculi.

For a more particular description, see *Marcet on Calculus Diseases*.

The state of the constitution which favours the production of these principles is a matter of interesting research. The disposition to form the lithic particles exists doubtless in a greater degree in some constitutions than in others, and hence has been called the lithic diathesis. In what this consists is not distinctly understood.

It is probably intimately connected with the deranged condition of the alimentary canal, as calculi are always accompanied with indications of impaired indigestion, and it is probable that the first link of the series of actions which causes this disposition has its origin in the stomach.

If I may be allowed to use the analogy derived from other diseases, this conclusion will be much supported from the concretions which take place in gout, and the connection between that disease, and the alimentary derangements. The conclusion will be more strongly supported, when it is considered that arthritic and urinary calculi, are very closely allied in their chemical composition. It is ascertained that the deposition in gouty cases is the Uric Acid, in conjunction with Lime or Soda, and the relation between the two diseases is moreover shown by an alternation of symptoms, and by the copious appearance of the red sand in the urine, as immediately preliminary to the subsidence of a gouty paroxysm.

The importance of the connection of the lithic diathesis with the state of the alimentary canal, cannot be too often repeated, when it is considered that in all cases of calculous diseases, it is necessary to pay particular attention to the general state of the patient's health, and along with medicines usually called solvents, to pursue a tonic and invigorating plan in respect to the stomach. In short, most, if not all, the antilithic medicines are tonic in their operation.

A deposition of the earthy phosphates from the urine, says Dr. Prout, is generally observed to be attended with very distressing symptoms. They consist in great irritability of the system, and derangement of the chylopoietic viscera in general,—such as flatulence and nausea—obstinate costiveness, or peculiarly debilitating diarrhœa, or both frequently alternating—and the stools are extremely unnatural, being either nearly black, or clay coloured, or sometimes like yeast. They are always accompanied by more or less of a sensation of pain, uneasiness, or weakness in the back and loins.

Such is the state and condition of the digestive organs previous to the appearance of stone or gravel, and it will be obvious, that the remedies called antilithics are such as will strengthen these organs, and correct the morbid condition of the first passages. How it happens that such a variety of deposits, as I have men-

tioned, should be formed, is difficult to conceive, and the only method I can take at explanation, will be to suggest the various and almost interminable results of morbid action, as exhibited in a diseased state of the liver, or other organs of the body.

The other class of medicines or Lithontriptics, are employed during the formation of urinary calculi, or after they are formed. To produce a solvent effect, it is necessary that they be brought into contact with the substance itself, and this is effected by the remedies passing into the circulation, from whence being separated by the kidneys, they are thrown into the urinary organs, where they exert a solvent action upon the depositions which may exist.

The practicability of this operation taking place has been inferred, from the facility with which these substances undergo solution out of the body, by their appropriate agents, and from its being clearly proved that many of these substances enter the circulation without having their chemical qualities materially impaired. Hence it was inferred, that as they enter the bladder, chemical decomposition might be effected. Those inferences were further supported from the very rapid manner, in which articles taken into the stomach have been known to pass into the bladder, and the probability that there exists a more direct communication between the stomach and bladder, other than that of the circulation.

In entering upon the subject, however, doubts may reasonably be entertained, whether calculi lodged in the bladder, and already too large to be discharged, by the natural passages, can be actually dissolved by any mode of internal treatment, especially when it is considered how strong a resistance the cohesive force of such calculi oppose, and the small extent of surface which they present in proportion to their mass. It might also too be doubted, whether the remedies which are classed under the head of Lithontriptics, could be conveyed into the bladder of such strength as to effect these objects. In endeavouring to fix a limit to the powers of these medicines, I am aware of the difficulties which overhang the subject, but I trust that I shall be able, by a statement of facts, to shew, that if the powers of these medicines have been overrated, still they are valuable agents in practice, and entitled to much attentive consideration. Compelled, as I shall be to admit, that the attempts to dissolve calculous concretions, after they have acquired any size, have been abortive, still all writers concur in the beneficial effects which have been produced by medicine, and in the great relief afforded to persons labouring under these disorders. Several well authenticated cases are on record of the symptoms of stone having disappeared, to such a degree, while upon the use of Lithontriptic medicines, as to induce a conclusion that the stone



had been dissolved. DeHaen relates a case of this kind, and Sir E. Home mentions two cases, where the symptoms had subsided under the employment of alkaline medicines, but on dissection the calculi were found in great size, only imbedded in cysts.

Dr. Marcet illustrates the beneficial effects of these medicines by the statement of a well authenticated case of a gentleman, who had suffered greatly from attacks of calculous affections, having been relieved for the space of ten years, by a constant and steady perseverance in the use of alkaline medicines. After death calculi were found in the kidneys and bladder, the surfaces being smoothed by the alkaline medicines, and the external layers loosened in their texture, so as to render it evident, that scales had been detached from them by a process of exfoliation.

The case of Lord Walpole affords evidence of an analogous kind published by himself in the *Philosophical Transactions* for 1751. He insisted strongly on the benefit he had experienced from the internal use of soap and lime water; and when he died, Sir J. Pringle, who published in the *Philosophical Transactions*, Vol. I. an account of the state in which the bladder was found, declares, that three small rounded stones were found in the bladder, and all the circumstances of the case concur to show that some impression had been made on the calculi, by the long continued use of those remedies. Other cases might be mentioned upon the authority of Sir A. Cooper to the same effect, but they would be only repetitions of what I have already said.

A question will naturally be suggested in connection with this point, which is, whether can acids or alkalies be actually conveyed to the urinary passages through the medium of the circulation? With regard to the alkalies the question has already been decided, that they are taken into the circulation, and are separated by the kidneys. Most practitioners who have paid attention to the subject must have observed, that a long course of alkaline medicines, will often, not only deprive the urine of its acid properties, but will render it decidedly alkaline, and even capable of dissolving lithic acid. Attention to this state of the urine will be shewn to be of primary importance, when I come to speak of the particular remedies, for the lithic concretions; as the danger of administering alkaline remedies, when there is a tendency to the phosphates will be seen, and the likelihood of these medicines producing mischief, when continued longer than is proper.

With regard to the acids the question is not so easily determined. The acids commonly used are the Muriatic and Sulphuric, and as the urine contains both of these, besides being a decidedly acid fluid, it would be difficult to determine the quantity of these in the urine, when taken into the stomach. Mr. Brande, however, has decided that acids taken into the stomach are actually

capable of being conveyed into the bladder, and this he has more especially endeavored to ascertain by experiment with regard to the carbonic acid. But we may take another view of this subject and not the less important, which is, that admitting neither alkaline or acid medicines to enter the bladder, yet acting upon the digestive and assimilating organs, in the one case by neutralizing any excess of acid in the *primæ viæ*, and in the other by checking a tendency to alkalescence, they modify the action of the kidneys and of course the secretions. The conclusions then that I would support upon the action of Lithontriptic medicines are

1. That these medicines are not entitled to be considered as solvents of stone in the bladder.

2. That in small calculi or gravel, or the forming stage of the disease, the symptoms derived from this cause, with the concretions, have been relieved, and dispersed, by the proper and judicious use of alkaline or acid medicines.

3. That in advanced stages of the disease, or after stones exist in the bladder, the symptoms of irritation produced by them, have been so much relieved by the use of Lithontriptic medicines, that the patient's life has been rendered easy and comfortable, to such a degree, by changes induced from chemical actions upon the surface of the stone, as to excite a belief that they had been dissolved, though they have been discovered in the bladder after death.

4. That even supposing these medicines incapable of exerting any action upon the urinary organs, yet, by correcting the morbid condition of the alimentary canal, either from a state of acidity or alkalescence, that they thereby disturb those affinities, which in the subsequent processes of assimilation and secretion, give rise to calculous affections.

The last and most important principle in the discussion of this subject, remains to be considered, viz. how are we to discover the nature of the calculus secretion so as to direct a suitable remedy? A knowledge of this principle is of primary importance, for without some rules to guide us in the application of our remedies, our practice is but empiricism, whence it is, that failing in several attempts to afford relief, we hastily decide that all is conjecture and uncertainty—that the practice in this instance is based upon an unstable foundation, when, in fact, the fault is not in the remedy, but in our insufficient knowledge of its application.

In the enquiry as to the means by which we are to be directed in the choice of a remedy adapted to the chemical character of the calculus, we are to be governed by an examination of the sediment deposited by the recent urine, or by an analysis of the small fragments which are frequently voided with it. It is in this stage, as I have observed, that we may speak of solvent medicines, and

that we may prevent such accumulations from taking place, which may end in stone. Of the many substances which are contained in urine, rarely more than three make their appearance in the form of deposit or gravel. These are Phosphate of Lime, Phosphate of Ammonia and Magnesia, and Uric Acid. The two former constitute a white sediment, and the latter forms a red deposit.

Whenever the white sand makes its appearance, it is a proof that the acid character of the urine, by which it is held in solution, is diminished. The urine is essentially an acid secretion as is proved by its changing vegetable blues red, when tested.

The acids which are contained in the urine, are the phosphoric, the uric, the carbonic and others, and when existing in due proportion, they suspend and neutralize lime and magnesia, but when the natural acidity is diminished, deposits are formed, consisting of phosphates of lime and magnesia, and are known by the familiar name of white sand. That this operation really exists is proved by adding an alkaline solution, as potash or soda, to recent urine, when this deposit will be found to take place.

Whenever, therefore, this white sand is noticed, in connection with other symptoms, which are, its being observed in the urine passed after meals, and then not merely as a deposit upon cooling, but at the time the last drops are voided, we will find that the internal use of acids will, in most cases, diminish or remove it.

The acids best adapted for this purpose are the mineral, and sometimes the vegetable, and of their application I shall speak hereafter.

Of the Uric Acid and its compounds, the next article which most frequently enters into the composition of calculi. These are distinguished from the preceding by the deposits being of a red colour, and are occasioned by an excess of acidity.

Here, as in the other instance, we must distinguish between those cases in which the red sand is actually passed, and those cases in which it is deposited some hours by urine which at first is clear. The former is an indication of a disposition to form calculi, and the latter is often a temporary symptom of indigestion. This is a very common occurrence in hepatic derangements.

From experiments conducted out of the body, it has been satisfactorily determined, that the proper solvents for these depositions are the fixed alkalies. Accordingly, where they have been employed, they have been found to prevent an increased secretion of uric acid, and, by a continuance of their use to remove it. Caution, however, should be observed in their administration, as by too long a use of them, the urine may be so changed, that the phosphates may be formed.

It was at one time considered that the alkalies should only be



employed in their caustic or pure state, but they cannot reach the bladder in a caustic state, combining, as they would, with the carbonic or other acids in their course. Experience has determined that the carbonates are equally valuable, and less likely to disagree with the stomach.

Alkalies, however, are not confined to their chemical agency, as they have been found to allay irritation of the bladder, and promote the flow of urine, in cases where from the chemical composition of the concretions, they could not act as solvents. Of the alkalies which have been most beneficial, with the forms of administration, I shall speak when upon the subject of the particular articles.

Notwithstanding the apparent clearness with which the different concretions may be distinguished, difficulties will arise in practice, from the changes which take place, either spontaneously or from the use of medicines in the composition of calculi, or from their being variously compounded. In most cases the directions I have given will be found sufficient, and where the chemical analysis of the deposits is required, very ample instructions will be afforded by consulting the valuable work of Dr. Marcet on this subject.

**REFERENCES.**—*Marcet on Calculus Disorders.*

*Observations on the Medico Chemical Treatment of Calculus Disorders, by W. T. Brande.*

*Medical Recorder, Vol. II., and Philosophical Transactions.*

#### ANTILITHICS.

By this term I would be understood as including those substances which correct the lithic diathesis, and alleviate the symptoms of stone or calculi, without exerting any action upon the stone itself. These substances include tonics and astringents.

That the class of tonics may prove Antilithic, will readily be admitted from what I have said, of the connection of the urinary deposits with the deranged condition of *primæ viæ*. Whatever will improve their powers of action will prevent the development of those principles which lay the foundation of, and are very intimately connected with the production of urinary concretions. For whatever tends to disturb the process of digestion, by favouring the production of acid, may be considered as an exciting cause of the lithic deposits, and, as was observed, was always preceded by great gastric derangement. Tonics, therefore, by correcting these dyspeptic symptoms will prove valuable resources.

Of the general effects of astringents, that of relieving the symptoms which attend the presence of calculus in the urinary passages, is not the least important. They have, therefore, with this view been employed, almost at all times and by the most eminent phy-

sicians. It has indeed been thought that they were useful in promoting the excretion of calculi, but it may be supposed that in those cases in which these concretions have been thought to have been expelled, relief has rather been obtained of the symptoms, than any such operation taking place.

That the symptoms may be relieved, without the stone being evacuated, has been sufficiently proved, and among the medicines which operate in this manner, astringents may be reckoned. A proof of this appears in the use of *Uva Ursi*, which, from the experiments of DeHaen and others, has been found useful in relieving the symptoms of calculus. This plant is manifestly a considerable astringent, and in what other manner it is useful in these cases may be difficult to explain. Dr. Cullen supposes that astringents are useful in absorbing acid in the stomach, and urges in support of this mode of action, the known benefit which follows some of the alkaline medicines.

This explanation seems to me very defective, and I should rather attribute the good effects which follow their use to the tonic impression which they exert, with that of lessening the sensibility of the bladder, and probably the acrimony of the urine.

Of the astringents which have been employed as antilithics, I shall only mention the

*Family Ericineæ—Arbutus Uva Ursi, or Bear Berry.*

It is an evergreen, creeping plant, with small oblong, oval leaves resembling very closely those of the common garden box. It is very extensively diffused throughout Europe and this country, at least as far south as the central parts of the United States.

*Description of the Plant.*

Stems procumbent, branches trailing on the ground, to the extent of 2 or 3 feet.

Leaves alternate, oval, firm, and rigid like those of the garden box.

Flowers of a flesh colour, in small clusters, at the ends of the branches, upon short red peduncles.

Berries, when ripe, red, and of the size of the holly berry.

The leaves when chewed have an astringent taste, combined with some degree of bitterness, and they abound in tannin which is their chief active constituent.

Its active principles are readily yielded to water and alcohol, but to water in a larger proportion, and on this account the decoction and infusion are preferred to the tincture.

The leaves of the plant have been employed by the ancients in several diseases requiring astringent medicines, but had almost entirely fallen into disuse, until about the middle of the last century, when the attention of physicians was drawn to them as a remedy in calculus and nephritic complaints. It is to DeHaen

that we are indebted for the revival of this article, as an efficient remedy in these cases. He speaks of it in high terms, and says that of those who had manifest calculus several had permanent relief, so that long after the medicine had been left off, they remained free from pain or inconvenience in making water, though the catheter showed that the calculus still continued—that others, who seemed to be cured, relapsed on leaving off the medicine, and were again relieved on repeating the use of it—while others obtained only temporary and precarious relief.

The efficacy of this article in nephritic and calculus cases, has been variously represented, by different writers on the *Materia Medica*. By some (Alibert) it has been represented as merely possessed of diuretic properties, and having no effect in relieving calculus or other diseases of the bladder. The weight of authority is decidedly in its favour, and though by few have all the beneficial results spoken of by DeHaen, (he practised medicine in Vienna, and had the superintendence of the Hospital in that place,) been confirmed, yet there is sufficient evidence to warrant us in regarding it as a very important remedy in these cases. The late Dr. Wistar spoke of it as very useful in these diseases, and found symptoms like those of urinary calculi completely removed by this medicine. Upon the whole, however, from the testimonies which have been given respecting the properties of this article, there can be no doubt that it proves a palliative for calculus symptoms in many cases and prevents their appearance.

In nephritic affections there is no doubt that this article may be considered a very valuable medicine, and should be in the hands of every physician. It is peculiarly adapted to cases of what is called nephritis podagrica, or nephritis depending upon gout. In paroxysms of this disease, this article is very efficacious in allaying sensibility and hastening relief of the symptoms.

Its employment should be premised with the administration of purgative and depleting medicines, which are to be repeated at proper intervals.

In cystitis, or inflammation of the bladder, in catarrhus vesicæ, in suppurations of long continuance in the kidneys, bladder, and its appendages, this medicine will often be found useful. In the first disease or cystitis, the symptoms are peculiarly distressing, and often bear a great resemblance to stone.

A case has been communicated to me by a friend, of a young gentleman who laboured under the symptoms to such a degree that he was advised by the most intelligent surgeons of our country to have the sound introduced, in order to discover the existence of stone. To this, however, he objected. He then had recourse to the *Uva Ursi*, in pretty large doses, and by persevering in its use was completely and effectually cured.



In gonorrhœas and gleans of long standing, this article employed in the form of a strong infusion, taken freely, has been found beneficial.

Much has been said of the utility of this article and of its application to several other forms of disease, but its efficacy in these cases I think very questionable. I shall not, therefore, employ your time in entering into their details,—should further experience satisfy me of their correctness, I shall be happy to add my tribute to its virtues.

The dose of the *Uva Ursi* is from x. to xxx. grs. of the powdered leaves, three or four times a day.

It may be given also in the form of infusion or decoction.

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*Family Urticæ—Humulus Lupulus—Hop.*

The Hop Vine is not only a native of most countries in Europe, but is indigenous to America. It has been found growing wild in remote and uncultivated parts of the interior, and also upon the banks of the Mississippi and Missouri.

The strobules or flowers have an aromatic and heavy odour, and a strong bitter taste. They have been held in repute as a tonic of some importance.

As an ingredient in malt liquors, its virtues have been long known, imparting, by its bitter principle, a tonic and agreeable flavour to them. It was introduced into the *Materia Medica* at an early period, and received, like many other medicinal articles, all those extravagant encomiums which are often bestowed upon a medicine, on its first introduction into practice.

It is unnecessary to dwell upon this article particularly,—its medicinal virtues seem to have been extolled much beyond its merits, and if it is allowed to be a slightly narcotic bitter, it is as much as it deserves.

To alleviate the attacks of Nephritis, it is well adapted. A strong infusion often relieves pain and quiets irritation. Possessing anodyne and diuretic properties it is calculated to fulfil the indications required, and its effects are often very gratifying. I have known it thus employed in this disease with much benefit.

It may be given in the form of infusion and tincture. The infusion is preferable in nephritic cases, and should be given pretty strong and drunk freely.

The tincture is the more agreeable preparation, and is preferred when the anodyne operation is required.

*Lupuline.*—The existence of this substance in the hop was made known by Dr. Ives, of New-York. It has since been described in France, under the name of the yellow matter of the hop. It is presented under the form of small yellow grains, pulverulent,

of an aromatic smell and bitter taste. It covers the base of the scales of the hop, and is separated from them by a fine sieve.

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*Family Solanaceæ—Capsicum Indicum—Red Pepper.*

Among Antilithics I may mention the use of this article. I have only the authority of a single case in speaking of it, and probably my observations may be premature. But I am acquainted with an elderly gentleman, upwards of seventy years of age, who has been distressed for several years with calculi or gravel. He has tried a variety of remedies, with occasional and temporary relief. Among the means he employed was active cathartics, and though affording much benefit, yet the operation was too exhausting to be long borne.

From the feeling of sinking, with the gastric derangements attending, he was induced to make trial of the Capsicum. Since using the article, he is fully impressed with the belief, that his life has been prolonged, being freed from flatulence, heart-burn, loss of appetite, and irregularity in the evacuations, which were so distressing.

The quantity he uses is very considerable, employing at his dinner five or six green peppers, cutting them up as salad, and mixing them with the food eat. The effect of this treatment by restoring his appetite, has been to restore his strength, and while promoting the functions of the bowels, giving to them greater regularity, it exerts also a diuretic operation. He also thinks some change has taken place in the structure of the calculi, that they are softer, more readily broken down by the muscular actions of the urethra, and expelled in a more pulverulent state.

The occurrence of this case, and the beneficial effects produced from Capsicum, have contributed very much to strengthen the opinions I had formed of the Antilithic powers of medicine.

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*Family Umbelliferæ—Daucus Carota—Wild Carrot.*

This article is not introduced under the head of bitter Antilithics, but as it is diuretic and often useful in gravel, the present seems the best place to speak of it.

The Carrot grows wild in many parts of the United States; and in the neighborhood of our City. It bears a considerable resemblance to the cultivated carrot, and was considered to be the same only in its wild state. It is much more active in its properties, and possesses a considerable degree of acrimony and bitterness. In many of the urinary diseases, the infusion of the root or seeds of this plant, is one of our best remedies.

Dr. Chapman relates a case of gravel, in which most of the antilithic medicines had been employed without any favorable results, and in which very happy effects were obtained with the use of

this article. The root is the part of the plant which is preferred, and by persevering in its use, cures have been effected. The form of administration is a strong infusion in the quantity of a pint daily.

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*Family Aliaceæ—Allivum Sativum—Garlic.*

Is the most powerful of the tribe of Aliaceæ. It was formerly much used as an Antilithic, but it lost its reputation as such. It has, however, of late been again introduced, and if we can credit the accounts given of it, it is a very valuable medicine. I do not know of any beneficial effects being produced by it. From its stimulus being powerful and diffusible, it may be used under the same circumstances and with the same advantage as the Capsicum.

The dose is half a garlic or half a table-spoonful of its expressed juice.

The Leek is said to be equally useful and may be administered in the same way.

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*Importance of Diet as an Antilithic.*

In concluding this class of medicines a few remarks may be properly introduced upon the subject of diet as an Antilithic. The secretions being materially influenced by the nature of the ingesta, the remarks upon this subject cannot be considered irrelevant. The subject has become particularly interesting since the discoveries of M. Vaucquelin and Dr. Wollaston. It being ascertained by M. Vaucquelin, that the matter contained in the urine of birds, which is voided along with their dung, consists principally of Uric Acid, Dr. Wollaston was induced to pay some attention to the different proportion, in which this matter is voided by different species of birds, to see how far it accorded with the different qualities of their food. He found that in the dung of the goose, feeding wholly on grass, the proportion did not seem so much as 1-200 of the whole dung. In that of a pheasant, kept in a cage, and fed on barley alone, it was about 1-14 part. In that of a hen having the range of a garden and farm-yard, and consequently procuring insects, and possibly other animal food, the proportion was manifestly much greater, and combined with lime. In the dung of a hawk fed upon flesh alone, the quantity of matter voided in a solid state, bears but a small proportion to the residuum of Uric Acid, that is left when the urine is dry. And in the gannet feeding solely on fish, he observed the evacuations in some instances to be mere urine, for it contained no solid matter, excepting the Uric Acid. It seems consequently deserving of enquiry, what changes might be produced in the urine of any one animal, by such alterations of diet as its constitution would permit, for as far as any inference can be drawn, from the above experiments, it would appear, that



persons subject to calculi, consisting of Uric Acid, as well as gouty persons, in whom there is always a redundancy of the same matter, have much reason to prefer a vegetable diet.—*Philosophical Transactions*, 1810, *part II*.

The preceding observations have much influence in determining our views as to the propriety of an animal or vegetable diet for those labouring under an excess of Uric Acid. It has long been a subject of discussion, but the experiments of Dr. Wollaston, are so ingenious and satisfactory, that it will be hardly admissible to doubt what has been so ably proved. Independent of these experiments, a week's abstinence from animal food, has been known to relieve a fit of gravel of the Uric character, when alkalies were of little avail, and in other cases the same plan has been most successfully adopted.

These observations of Dr. Wollaston, of the connection of Uric Acid concretions with the nature of the ingesta, have been confirmed by others. Andral in his *Pathological Anatomy*, notices the changes the blood undergoes by the use of a diet containing much azote or nitrogen, of which nature is animal food.

Not only does the blood acquire an additional quantity of fibrine, (and hence these persons are much disposed to inflammatory diseases,) but under the same circumstances, a superabundant secretion of Uric Acid takes place in the kidneys, and gives rise to the complaint called gravel. Not only does it exist in a greater quantity in the urine, but it occurs in other parts of the system. It forms around the joints, is found in masses between the fasciculi of several muscles, in the subcutaneous cellular tissue, and even in the spongy extremities of the bones.

The best way to change this superabundant secretion, is to change the diet of the person affected, and to give him food containing as little azote as possible. He should therefore avoid as much as possible animal food.

As a healthy state of the digestive organs is what we should have in view, it may be found detrimental to restrain patients affected with calculus of the uric acid character, from taking a due proportion of animal, as well as vegetable diet. They should also particularly abstain from all things which manifestly disagree with them, such as heavy unfermented bread, hard boiled and fat puddings, salted meats, acescent fruits, and soups of every kind. In general also, malt liquors and wines, particularly of an acescent quality, will be injurious. Errors, therefore, in these respects, should be guarded against.

But it is not only important that these articles should be avoided which are unwholesome,—regard should be had to the quantity taken of those which are wholesome. Errors in this respect are

probably more injurious than in quality,—at least they produce the same effect.

When the sediments consist of white sand, or the Phosphates of lime or magnesia, we should adopt a general acid system of diet, as far as may be compatible with the state and condition of the alimentary canal; to abstain from soda water and all alkalies; to take weak lemonade, and an occasional glass of cider, as ordinary drink at meals, and if accustomed to wine, to prefer Champagne and Claret, to Madeira and Port, but to take little of either, and to eat salads and acid fruits.

#### PARTICULAR LITHONTRIPTICS.

In pursuing the subject of Lithontriptics the arrangement I shall adopt in treating of the particular articles of this class, will correspond with the general view I have taken. I shall speak first of those substances which are considered as solvents of the white sand, or of the Phosphates of Lime, and Ammoniac Magnesian Phosphates.

This division will comprehend all of the acids, as these deposits have been commonly supposed to depend upon a deficiency of the acid qualities of the urine.

*Carbonic Acid.*—At the time when Dr. Priestly first published his experiments and observations upon fixed air, much excitement was produced among literary and scientific men, and its nature and properties were fully ascertained. About the year 1775, it was first employed by Dr. Saunders as a solvent for the human calculus, and the practice was speedily followed by Dr. Percival. This gentleman speaks in the highest terms of the Lithontriptic powers of a medicine, which is at once grateful to the palate, strengthening of the stomach, and salutary to the whole system. He speaks of it as having advantages over lime water, which often nauseates the patient, destroys the appetite, and creates heart burn,—or to the alkalies, inasmuch as from their acrimony and causticity they can only be taken in the smallest quantity. The Carbonic Acid may be drunk in the largest quantity without satiety or inconvenience—it requires no restrictions in diet, and its medicinal virtues will be undiminished in the stomach or bowels.

It has, however, been doubted whether the Carbonic Acid is capable of penetrating the circulating fluids and reaching the bladder in an uncombined state, so as to act as a solvent on the urinary calculi. Dr. Priestly was decidedly of this opinion, having, as he says, more than once expelled, from a quantity of fresh made urine, by means of heat, one-fourth of its bulk of pure fixed air, as appeared by its precipitating lime, from lime water. By subsequent writers it has been much extolled, and cases illus-

trative of its beneficial effects in preventing the white sand, have been cited.

The mode in which Carbonic Acid is administered, is either united with water, in which case it may easily be prepared by the patient in a Nooth's apparatus, or procured from the dealers in artificial mineral waters. It may be drunk freely.

*Priestly on Air, Vol. II. 216, Appendix.*

*Mineral Acids.*—These comprehend the Nitric, Sulphuric and Muriatic. Though agreeing in their general properties, there are particular cases in which one is more proper than the others.

The Nitric Acid is perhaps most apt to disagree, and to occasion those symptoms of indigestion which are announced by flatulency and eructations,—and in a few instances its long continued use has rendered the stomach reluctant of food, though many instances might be cited of its tonic effects, as promoting digestion and increasing appetite.

The Muriatic has at different times been spoken of in high terms, by several physicians, particularly Mr. Copland, in persons subject to gravel complaints—who are distressed with a frequent desire to make water, voiding it with pain, and in small quantities, accompanied with an obtuse pain in the region of the bladder. Upon employing this medicine a week or ten days, to the extent of thirty drops three times a day, a considerable discharge of sand and gravel with the urine has taken place, followed by relief of all the symptoms.

The Muriatic has been considered most likely to agree with the stomach, but not so with the bowels, which are always more relaxed during its use, than when the other acids are employed,—this circumstance, however, often recommends it,—for constipation very frequently attends the state of the body, which favours the formation of white sand, and hence aperient medicines are alone adequate in some cases, to suspend or prevent the disorder.

As the recital of cases will illustrate the utility of any practice particularly in diseases so little attended to as the present, I shall avail myself of every opportunity to enforce the treatment recommended by examples.

A gentleman from Birmingham, Eng., went to London for advice, and placed himself under the care of Sir A. Cooper. He was labouring under some irritation in his bladder and urethra, attended with frequent micturition and a copious discharge of white sand, mixed with shining crystalline particles, the quantity of which amounted to eight or ten grains every time he voided his urine.

Muriatic Acid was prescribed in the dose of five drops of the concentrated acid, properly diluted, three or four times a day. In



a few days the symptoms were relieved. This treatment was continued for about two months, during which there was no calculus discharge, except now and then a little lithic acid. The patient's health seemed to improve, and his urine remained free from calculus depositions.

The Sulphuric Acid is most properly considered tonic, and generally admits of being longer persevered in than either of the others.

It might be inferred from what has been said of the state of the first passages, and their disordered condition generally, that these acids would be likely to disagree in most cases. The contrary, however, is the case, and this affords me an opportunity of pointing out an essential distinction in the operation of the Vegetable and Mineral Acids. The former are very likely to undergo decomposition during the process of assimilation, and form such combinations as are likely to prove injurious—the latter on the contrary, possessing strong powers of combination, are incapable of being decomposed in the digestive organs. Hence while the distressing gastric symptoms are aggravated by the one, they are relieved by the other, and the remark is applicable not only in this disease but in others.

When the use of the acids produces much irritation of the urinary organs, they should be intermitted, or opium employed to allay the pain. Costiveness is to be obviated by laxatives.

The dose of the acids is from 5 to 30 drops, three times a day, in plain or barley water.

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*Vegetable Acids.*—In consequence of the Mineral Acids disagreeing with children, recourse must often be had to the vegetable. They are equally liable with adults to an increased secretion of the phosphates, and in whom prompt and effectual treatment is required, to prevent the formation of stone in the bladder.

The Tartaric Acid, either in its pure state, or as it exists in Cream of Tartar, may be used in pretty liberal doses.

Of the former from 5 to 20 grains, and of the latter from 20 to 40 or 60 grains may be used, dissolved in barley water, or other convenient vehicle. The Cream of Tartar is more apt to relax the bowels than the Tartaric Acid, a circumstance which has been hinted at above often renders it more beneficial.

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Having completed the consideration of the articles which operate favourably where the urinary deposits, consisting of the phosphates, are found, I shall proceed to the next division, or those concretions which have for their basis Lithic or Uric Acid.

These are supposed to occur when the acid of the urine is in excess, and the alkalies are known to be their best solvents.

They are distinguished from the phosphates by the sediment being of a red colour. The efficacy of the alkalies and the alkaline carbonates being sufficiently proved, the question to be considered is the kind to be preferred, and the mode of using them.

*Carbonate of Potash and Soda.*—These articles were formerly employed in their caustic or pure state, as being more efficient. Experience has ascertained that in this state they are not more active than the carbonates and more liable to disagree with the stomach.

Soda seems by common consent to be preferred to Potash being more mild and less liable to disagree with the stomach, and Fourcroy states it as his opinion that Soda is more eligible for medicinal purposes than Potash, on account of its analogy with animal substances which always contain it, while on the contrary, no portion of Potash is found in them. Still there are cases in which the Potash has dispelled symptoms which had withstood the operation of the former, and on this account they should both be retained and employed.

The form in which Soda is most usually and conveniently taken is that of the well known artificial beverage commonly called Soda Water, in which the carbonated alkali being supersaturated with Carbonic Acid by great mechanical pressure loses its caustic and disagreeable taste. A tumbler-full of this water containing from ʒss. to ʒi. of the carbonated alkali makes a pleasant beverage in which the offensive effects of the alkali are entirely obviated. Dr. Beddoes directs ʒii. of the Carbonate of Potash or Soda to be dissolved in water, and this to be impregnated with fixed air by a Nouth's apparatus, of this xii. to xxiv. ozs. may be taken daily.

Potash in doses of xv. to xxx. grains may be given in solution at a dose, morning and evening. It sometimes produces great gastric distress, which may be diminished by uniting with it mucilage of gum arabic, or given in thin broth. Still it cannot be given long without producing uneasy symptoms in the stomach. On this account it may also be given in solution, supersaturated with Carbonic Acid, which obviates its bad effects upon the stomach.

Or the alkalies may be freed from the water of crystallization, and made into pills—the quantity taken should be ʒss. to ʒi. daily. That these medicines prevent or diminish the secretion of calculus matter, the following fact related by Dr. Black, in his lecture on Lithontriptics may be adduced.

Lithotomy was performed on a man in the Royal Institution of Edinburg. The wound not healing kindly it was examined by the surgeon and a calculus incrustation was observed which prevented its union—this was detached and an alkaline solution was exhibited. The cure of the wound progressed rapidly. The reme-

dy was omitted, and another incrustation soon covered the edges of the opening. It was again removed, and its recurrence prevented effectually by the repetition of the medicine. This fact proves that the alkalies counteract the calculous depositions.—*Dorsey's Inaugural Dissertation.*

Of other cases of the influence of the alkalies in correcting the disposition to the lithic acid concretions, the following may be relied upon.

A middle aged gentleman of literary habits, of remarkable firmness of mind and accuracy of observation, was seized with symptoms of calculi in the kidneys, attended with frequent acute paroxysms, generally terminating in a discharge of calculous matter of the lithic acid. He continued nearly twenty years in a state of almost constant and increasing suffering, taking a variety of medicines with great perseverance and with occasional benefit, but without permanent advantage. At last, at the suggestion of his medical friends, he began to make use of an alkaline lixivium in daily and considerable doses. The benefit derived from this medicine was so great and obvious that he persevered in it for ten years;—after which he died at a very advanced age, of a complication of infirmities, the calculous disorder remaining greatly mitigated during the last years of his life.

A journal kept by this gentleman, of his own case, concludes in the following manner—"Having continued a plain relation of facts during ten years use of the alkaline medicines, I can assure others, from my experience, that these medicines may be persevered in with safety when taken regularly, and in all common cases with the most hopeful prospects of success."—*Marcel.*

A third case has been politely furnished me by a graduate of our school, Dr. C. Capers. A person residing in one of the Northern States, had, for a length of time, been afflicted with a calculous affection, familiarly termed gravel. The uneasiness produced by the disease, had so worn down and enfeebled his constitution that he had become unfit to engage in any duties by which he could derive a support. Professor Silliman at this time established a Mineral Fount for Soda Water, the first that was established in this country—this person was engaged for the purpose of supplying those who called for it. The privilege was granted him of using the Soda Water strongly impregnated with Carbonic Acid gas to the extent he desired—since it was with a view to test the efficacy of this article that the person was placed in this situation. The free use of the waters succeeded in relieving him entirely in the space of three months and restoring him to perfect health.

This case, added to others mentioned, I consider conclusive of the efficacy of these medicines in the forming stages of these com-



plaints, and further points out the necessity of persisting in their use, until an entire change has been effected in the system.

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*Soap*.—The alkalies have also been much used in the state of Soap. This article does not possess any qualities independent of the alkali with which it is combined, and when taken in large doses has been known to have proved singularly effectual. But it is not generally commendable in such cases, as it is extremely apt to impair the digestive powers of the stomach and to lay the foundation of dyspepsia. When soap is used it is of course only the purer kind, such as is made with the mild expressed oils.

The dose may be ʒss. to ʒi. daily, in pills or otherwise.

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*Aqua Calcis* or *Lime Water*.—Has been long known for its powers of lessening pain, and removing the symptoms of calculous disorders. It was held in much repute by Dr. Whytt, and from the beneficial effects derived from it in the case of Lord Walpole, in conjunction with soap, it came into very general practice. For a very interesting account of the case, I refer you to the *Philosophical Transactions*, Vol. L. To be effectual it must be given in large quantities and continued for a considerable time, not less than a quart or three pints daily, and when persisted in appears to be innocent and no ways injurious to the health. It is, however, an inconvenient and ineffective form of alkaline medicine, and is not entitled to any very great consideration.

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*Magnesia*.—This is another article which has been much resorted to in the treatment of calculous complaints. It was suggested by Mr. Home, under the idea that the generality of calculous complaints, might be prevented, by introducing into the stomach, such substances as are capable of preventing the formation of uric acid, and that this mode of treatment would have many advantages over the usual method, which consists in dissolving the uric acid after it is formed. Magnesia, from its insolubility in water, seemed well adapted for the purpose, as it would remain in the stomach until it should combine with any acid. It was accordingly tried in many cases, where the disposition to uric acid secretion existed to a very great degree, and after the alkalies had been employed for a length of time, with results strongly conclusive of the superior efficacy of Magnesia to the alkaline salts, inasmuch as the red deposit, indicative of uric acid more readily subsided under its use. In the cases in which it was used, the patients very generally complained of heart-burn, and a sense of weight and uneasiness about the region of the stomach, both of which symptoms soon disappeared.—*Philosophical Transactions*, Vol. 1810.

Magnesia may be used either as calcined or a sub carbonate ;—the latter is generally preferable, except where the stomach is distended by wind, and in that case calcined magnesia should be used.

The remedy is particularly commendable when the alkalies have been employed for a long time, when they excite flatulency and indigestion, or disagree with the bowels, or when the red sand continues to be formed even during their free use. The dose in which it may be administered is from 15 to 20 grains, two or three times a day, in any convenient vehicle. Care should be taken to prevent an accumulation taking place, (as it is apt to collect and clog the bowels,) by the occasional administration of a mild aperient.

In considering the subject of Magnesia, we cannot but view it as a useful addition to the medical treatment of calculous disorders. Being less offensive to the stomach and yet capable of removing acidity from the digestive organs, it is often found advantageous to use it in long protracted cases, rather than caustic or sub-carbonated alkali, the constant use of which would ultimately injure the stomach. The utility of this article illustrates the pathology of calculous diseases, such as I have endeavored to point out to you. Its operation, which, as far as we know, is exclusively exerted upon the stomach and alimentary canal, correcting the morbid condition of their contents, points out the connection of urinary deposits with their deranged state, and I might almost say their dependance upon the condition of those organs. Since, in the results which follow the administration of this article, we see that an acidity of the first passages is corrected, the red sediment of the urine is diminished, and ultimately removed.

There is the most intimate relation between the substances taken into the stomach and the urine. If there be too much acid in the stomach there will be too much acid in the urine—if too much alkali in the stomach, there will be too much alkali in the urine also, unless the powers of the constitution be sufficient to counteract the prevalence of one or the other, by a new combination, for nature will attempt, and often successfully to neutralize whatever may be in excess.

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The last of the means which have been recommended for the solution of calculi are Injections of various substances into the bladder, with a view gradually to dissolve the stone, or to reduce and divide it into fragments sufficiently small to admit of their discharge. The acids and alkalies sufficiently diluted have been used in this way, and with prospects of success. Fourcroy in his system of chemistry has related several encouraging attempts of this kind, which have been repeated in England and in this country.

The nature of the calculus being ascertained, very dilute solutions of the acids or alkalies are to be employed. The alkalies exert less irritation than the acids, but both may be used and retained sometime in the bladder, with little difficulty, when so much diluted that they might be swallowed without inconvenience, a state in which they can still act on the concretions. The proportion to be used at first is two drops of acid to  $\bar{\text{z}}$ iv. of water, and the acid may be increased to twenty-three drops, without producing any inconvenience, though the solution be retained as long as an hour.

It is a necessary precaution that the patient should empty his bladder, as much as possible just before the injection, both in order to take off any irritation arising from distension, and to relax the sphincter of the bladder, and also with a view to prevent the alkali from uniting with the phosphoric acid of the urine, so as to neutralize its effects. It is also requisite that the fluid used be made of the temperature of the human body, or  $96^{\circ}$ .

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*The Gastric Juice of Animals.*—The gastric liquor of animals injected into the bladder was used by the late Dr. Dorsey as a solvent for stone. The reasoning upon the operation of the gastric juice was ingenious, and the experiments creditable to the talents of the late distinguished Professor, but I believe the results were not so decided as to have been repeated, certainly not to be trusted at the present time.

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## DIVISION IX.

### EMMENAGOGUES.

By this term is comprehended those medicines which promote the menstrual secretion. From the uterus of every healthy woman who is not pregnant or nursing, there is a discharge resembling blood, which from its periods or returns is called Menses or Catamenia. It commences at the period of puberty, and continues until the forty-fifth year of life, during a period in general of thirty years, and may be considered as the developement of the sexual life. The human female is the only animal subject to this law, and if different climates, or the varieties of the savage and civilized life are capable of modifying the phenomenon, their influence is not sufficient to annihilate it altogether. In the frozen regions of the north its occurrence has been denied by travellers, but even here it is equally constant and regular.

In its period of appearing it is influenced by climate, constitution, the delicacy and hardness of living. The warmer the cli-



mate, the sooner it appears. Its approach is denoted by symptoms more or less violent, according to peculiarity of constitution or other circumstances. These in general are pains in the loins and about the pelvis, lassitude with painful affections of the lower extremities, and various nervous and hysteric feelings. To these are added headache and flushings of the cheeks.

The symptoms described return often with greater intensity, when they are succeeded by a bloody serum, and then by a fluid of a darker colour. This commonly puts an end to all the uneasy feelings, the pains subside as the discharge proceeds—the inflammatory symptoms about the uterus go off, as the determination to that organ ceases—the pulse is diminished, and the secretion ceases with a serous fluid. Of the nature of this discharge I will refer you to what has been said by the Professor of Obstetrics.

The importance of this discharge may be conceived, when it is considered that its existence is necessary to preserve the uterus in a proper condition for conception—it being fully proved that women who do not menstruate, or who are not in a state disposed to menstruation cannot conceive. It was in allusion to the healthy performance of the uterine secretions, that Van Helmot declared—*Propter solum uterum mulier est, id quod est*. But though we are not prepared to go to this extent, yet we must admit that a derangement of this function shall defeat the great object of human concern. Upon its appearance the generative organs of the female exert an influence which modifies the whole organization, and bestows upon woman the most striking traits of her physical and moral character. The various revolutions to which her system is liable—the nervous affections, the frequent returns of indisposition and suffering—the strange and unaccountable caprices and anxieties, and sometimes the increased acuteness of the imagination and judgment, all depend upon its influence. If such be the power which it exerts upon the system, we shall not be surprised to find that a cause so widely operative, should be liable to frequent derangements which have marked effects upon the constitution. Accordingly it will be found that most of the chronic affections of females, have their origin in, or are intimately connected with the deranged state of this and other secretions of the uterus, and an enquiry into their condition in the treatment of these affections should never be overlooked.

Medical men being aware of this fact, have applied themselves with diligence to promote this secretion—but from the frequent failure of their endeavours, doubts have arisen, as to the beneficial effects of medicines in these cases. The precariousness of this class of medicines, those who have had experience must allow—still I am decidedly of the impression, that we are possessed of medicines which exert an action upon the secretions of the

uterus, and if failure attends their administration, it proceeds from the incorrect ideas which are entertained of the nature of the Catamenia, and our inattention to the state of the system. The fact is, the practice in these cases often is in a great degree empirical, and the want of success proceeds from neglect of those circumstances, which should influence their operation. Alibert observes that there are few disorders, which depend upon such a variety of causes, or are connected with such different conditions of the general system, as obstructed catamenia. Hence, its remedies are so various, and often of such contrary characters, and hence too, the great uncertainty of our remedial measures in such cases. Many of us may have observed, the great facility with which the emmenagogue operation, of a particular agent, has been produced, after the system has been subjected to a process of preparation, when the same substance has proved perfectly futile without it.

In some cases the suppression of the menstrual secretion is produced by the general relaxation and debility of the system, and hence, our best remedies will be such, as will invigorate and restore it. Here exercise, tonics, the cold bath, and a nourishing diet, produce the best effects.

At other times, an opposite condition of the system exists, connected with a considerable degree of rigidity of fibre, and a high degree of arterial action. In these cases a contrary plan is to be pursued, and the best emmenagogues will be venæ section, and other depleting remedies.

In prescribing, therefore, for a suppression of the catamenia, it is of the utmost importance to attend to the general state of the system, as without it, we shall frequently be baffled in our attempts, and our medicines may often increase the disease they were designed to cure.

I shall divide the medicines of this class, into such as increase and such as diminish arterial action: and before commencing to speak of the individual articles, I cannot but state that I think we are in possession of remedies, adapted to the varying condition of the system, provided we use judgment in their selection.

#### STIMULATING EMMENAGOGUES.

Of the Emmenagogues which increase action, I shall speak of those which stimulate the arterial system, and those which give tone to the system generally. Under the first head is the

*Family Polygalæ—Polygala Senega.*—This article has attracted very general notice from the medical public, not only in this country but in Europe, where it may be found occupying a regular place in the stores of the druggists. It grows in most latitudes

of the United States. The root is the only part used, and it is possessed of very strong sensible properties. When chewed it leaves a sensation of acrimony in the mouth, and still more in the fauces if it has been swallowed. These properties it communicates fully to water upon boiling.

Medicinally considered it is capable of fulfilling a variety of indications, to which I have already alluded, when treating of diuretics. It is an active and diffusible stimulus—an expectorant—sialagogue—diuretic—diaphoretic.

Dr. Cullen thought it a very feeble medicine and placed it among his cathartics, because he said its purgative property was the only decided one it possessed. From this, I conclude that his experience with this article must have been very limited, for it seldom purges unless in very large doses, but produces its best effects when not cathartic.

The Senega was first introduced into notice by Mr. Tennent of Virginia, in the beginning of the last century, who learned its use from the Indians, and was recommended by him as an excellent medicine for curing the bite of the Rattle-Snake, and for the treatment of Pneumonia.

Since that time it has become more extensively known and used by physicians. To Dr. Hartshorn, of Philadelphia, we are indebted for the discovery of its efficacy in Amenorrhœa in which disease it displays its best powers. Dr. Chapman who has had much experience with this article, speaks of it in the highest terms, and has related several cases in proof of its great efficacy, and as illustrative of the particular state and circumstances of this deranged function, to which it is best adapted.

The first case was that of a maniac, who had been confined to her cell for more than a year, being for the most part furiously deranged. She had been copiously depleted by every means, and had undergone salivation. Besides these remedies a variety of emmenagogues had been tried without effect. Being told that she had not menstruated since her illness, Dr. C. directed the Polygala Senega in the accustomed dose, occasionally to lose some blood, and to use the tepid bath. After a few days she was evidently better, and at the end of some weeks a copious flow of the catamenia came on, with the most salutary consequences. Her mind now became tranquil, and the medicine being continued for four weeks, she menstruated again, and becoming still better she was dismissed.

The second case was also a maniac, and in many leading features resembled the preceding one. In this case the mind was more sane but a strong tincture of lewdness was observed in her deportment, and in less than a week this was so much increased as to amount to confirmed Nymphomania, associated with extreme mental vivacity and apparent joyousness of heart.



Dr. Chapman immediately determined to rouse the uterus if possible to a catamenial secretion. He accordingly ordered the decoction of Senega, which she took for a fortnight without advantage. The dose was therefore increased to  $\zeta$ ii. every hour. At the next visit which was made, a very extraordinary alteration was observed in her demeanor. Instead of the eager and impassioned salutation which she had been in the habit of bestowing, she remained on her bed tranquil and sedate, composed both in body and mind. She seemed to be indulging a melancholy contemplation, from which it was not easy to divert her. Enquiring of the nurse what had so suddenly revolutionized her condition, Dr. C. was informed that she had been menstruating copiously for the last thirty-six hours.

The medicine was then omitted, and the case trusted to nature, but in three weeks some menaces of a relapse appearing, the medicine was again resorted to, which speedily had the desired effect, and she again became convalescent as before.

These two cases are highly important in a practical point of view, as they shew the connection existing between the state of intellectual derangement and the uterine organs. It opens a new view in the treatment of mania in females, and conclusively proves that amenorrhœa if not a cause of insanity, at least is intimately concerned in its production. They furnish us too with the important fact, that in some cases of mania occurring in females, a cure may be effected when other means have failed, by simply producing a return of the catamenia.

Besides the usual causes of amenorrhœa which are treated of by most systematic writers, this complaint has been observed to be produced by a membranous substance, formed within the cavity of the uterus. Morgagni was the first who noticed this substance with accuracy, and by Dr. Denman our attention has been more recently called to the species of amenorrhœa, to which it is incident. The appearance of the substance is as follows—It is a membranous lining of the uterus, retaining the figure of the inside of that organ, being smooth internally, and on its external surface shaggy and flocculose. In consistence it resembles impacted mucus, or that substance denominated by anatomists *parenchyma*, and in colour similar to the decidua, but being twice or three times as thick as is that membrane usually. The existence of this production creates much difficulty and embarrassment in the treatment of amenorrhœa, and it is found to attend in very obstinate and long continued cases. The Senega is not only adapted to all the forms of amenorrhœa, but particularly to those cases where this deciduous membrane exists.

Of the manner in which it is formed we cannot very easily conceive, it is, however, very probably produced by the vessels

of the uterus which pour out the catamenia, and when it exists the menses are always suppressed. To effect its expulsion it is necessary that a forcible and specific impression be made upon the uterus, and this impression the Senega seems particularly calculated to produce.

The habits to which it is best adapted are those of a feeble slender make, and of a temperament apparently cold and leucophlegmatic.

In preparing the Senega for use, it is done in the following manner—To  $\mathfrak{z}\text{i}$ . of the root bruised, add 1 pint of boiling water, simmered slowly over the fire until the fluid is reduced one-third. Dose,  $\mathfrak{z}\text{ss}$ . to  $\mathfrak{z}\text{i}$ . several times a day. When the menstrual effort is expected to be made, and until the discharge is actually produced, it may be pushed as far as the stomach will allow, and on these occasions it may be given to the extent of  $\mathfrak{z}\text{ii}$ . every hour.

In the intervals of the menstrual period the medicine should be omitted for a week or two. Without these intermissions if it does not loose its efficacy, it becomes nauseous and disgusting to the patient.

Should it produce nausea which it is apt to do, it may be prepared with the addition of an aromatic, such as orange peel or cassia.

In considering the general properties of the Senega, little doubt can exist but that it actively promotes the various secretory discharges. This is especially manifested in the glands of the mouth and fauces, and the neighboring secretory surfaces. When to this is added its action as a diaphoretic, little doubt can exist but that it exhibits its good effects, by promoting actively the uterine secretions.

Dr. Hartshorn, by whom this medicine was introduced in the treatment of amenorrhœa, says, that he has employed it in twenty-three cases of this complaint. In thirteen of them the menses appeared during the use of the decoction. In two the health of the patients was very much improved, but the catamenia did not return. In three no advantage whatever was derived from it. In the remaining five cases, he was not able to ascertain the event. In the last in which he used the remedy, the chlorotic symptoms were very violent, the menses had been suppressed eight months. From  $\text{xii}$ . to  $\text{xvi}$ . ozs. of the decoction were taken in the course of twenty-four hours for two weeks—the menses then appeared, and the patient has since enjoyed much better health.

It is proper in using the article always to commence its exhibition at least two weeks before the period when the patient usually menstruates. It produces no mischievous effects, and might be exhibited with safety for a much greater length of time.

I have thus presented you with the most interesting facts known relative to one of our indigenous articles.

By Dr. Chapman, of whose experience and judgment I need say nothing, it has been recommended as one of the most active, certain and valuable of the emmenagogues. That it is possessed of very active properties, the testimony of most writers fully confirms; but whether it is entitled to the encomiums which have been bestowed upon it, judging from my own experience, I should be disposed to doubt. It will often produce good effects, and the results of its application in many cases are highly satisfactory—but you must not be too sanguine. In the treatment of amenorrhœa, notwithstanding all our care and caution, we will meet with disappointment—the state of the secretion being influenced by such a variety of causes, that no single remedy can at all times prove effectual. From this circumstance I would infer the importance of a variety of remedies, adapted to the varying forms of the disease, and from all that I do know of the Senega, I think it will be found worthy of a trial, and of holding an important station among the emmenagogues.

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*Family Coniferæ—Juniperus Sabina* or *Savin*.—Natural History.—This is a small evergreen tree, a native of the South of Europe. The leaves and tops only are used, and they have a moderately strong smell, somewhat disagreeable, and a hot bitterish acrid taste. They give out part of the active matter to water, and the whole to rectified spirit. It is nearly allied to Senega in its properties, being a warm, powerful and diffusible stimulus, increasing the secretions, and determining with peculiar force to the uterus, thereby proving emmenagogue.

Its action upon the uterus is so strong, that it is said to have been employed for purposes the most infamous and unnatural, and it has been remarked that it is peculiarly apt to produce hæmorrhages from the uterus.

It is said to be used for the purpose of procuring abortion in Germany, and the late Professor B. S. Barton stated in his lectures that a married woman dying, confessed to him that she had procured four abortions in three years, by using a decoction of this article.

The first satisfactory account of its medical powers, was given by Dr. Home, of Edinburgh, who seems to have had much success with this medicine. In five cases of amenorrhœa, which occurred at the Infirmary, at Edinburgh, four were cured with Savin, administered in powder from ℥i. to ʒi. twice a day.

The constitutions to which it is best adapted are the weak and relaxed, and it is improper in plethoric habits before previous bleeding has been practised.



By Burns it is recommended in cases of amenorrhœa occurring in a debilitated chlorotic condition of the system. It will sometimes fail as an emmenagogue, but this may be attributed to the smallness of the dose given by physicians.

I have used the Savin in amenorrhœa, and from its general properties judge it very useful in some cases. As it is an active stimulant, it is only to be employed in those cases of amenorrhœa connected with atony of the uterine system, and if it has lost reputation, it probably proceeds from the indiscriminate manner in which it has been administered.

It is given in substance in the dose of from ℥i. to ℥ii. three or four times a day. The powder is not the best form of administering the Savin, as it is not readily pulverized, without previously drying it, and as the active part is an essential oil, very readily volatilised by heat, its activity is often impaired by this process.

It is given in the form of infusion, in the proportion of two drachms of the leaves to a pint of water, and simmered a short time. To this ℥ii. of syrup may be added, and a wine-glassful taken every two or three hours.

Besides these forms of using the Savin, the essential oil has been highly recommended by some of the physicians of our city, and is given in the quantity of vi. drops on a lump of sugar increased to x. to xii.

This article has been spoken off in high terms in chronic rheumatism, by Dr. Chapman, but it is not one upon which I would place much confidence, and shall refer you to his Therapeutics for information.

The leaves are used externally as an escharotic either in powder or infusion. Equal parts of the powder and verdigris, form a good application for venereal warts and other excrescences, and the infusion is used as a wash for foul ulcers, in tinea capitis, &c.

The Savin ointment is found very effectual to dress blistered surfaces, to keep up the discharge.

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*Juniperus Virginiana* or *Red Cedar*—Is nearly allied to the preceding. It is the largest of the Junipers, and is to be found in every part of the United States. It attains to a greater size in Virginia and further South, than it does northwardly. It bears a considerable resemblance to the Savin, insomuch that a botanical distinction is not easily drawn. In their sensible and medicinal properties they are nearly allied, and it appears to have been first introduced into practice from its great resemblance to the true Savin. Like that article it is found to be stimulant, diuretic, and emmenagogue, and to have been used with success in catamenial obstructions, in rheumatism, and dropsy. It is also used in the composition of a cerate, for keeping up the irritation and discharge of blisters.

The cerate is prepared by boiling the fresh leaves for a short time in about twice their weight of lard, with the addition of a little wax. When applied to a blistered surface and repeated twice a day, it rarely fails to keep up the discharge, for as long a time as it is used. The plaster should be changed two or three times a day, as the discharge becomes under its use of a puriform nature, and concretes upon the surface of the sore.

*Tincture of Cantharides.*—This is an article of considerable activity, and has been employed in cases of suppression, connected with atony of the uterus. That it may well be employed as an emmenagogue, might be inferred from its decided effects upon the abdominal, and more especially the pelvic viscera. In the production of strangury, its action would not appear to be confined to the bladder, but it excites all the different organs in its neighborhood. The uterus partakes of this action, and is thereby often excited to pour out the menstrual secretion, and, in my opinion, the emmenagogue power of this article, depends chiefly on these local effects, rather than upon its stimulant operation on the general system. The bowels, we know, are much affected by the production of strangury, and patients have been heard to complain, that the passage of the fæces through the rectum, excited a sensation of heat or burning, similar to that which attends the voiding of urine. If such be the strength of the impression produced by the presence of strangury upon the alimentary canal, the uterus, we may suppose, is likely to partake of an equal inflammatory action.

In order to exhibit the emmenagogue operation of this article, I cannot do this more satisfactorily than in stating two cases in which it was employed.

The following is from Dr. Klapp's published cases.

A lady, while labouring under her periodical complaint, was exposed to cold, the consequence of which was a suppression of the secretion. In a short time an unfavorable change took place in her health. She was troubled with pain in her head, vertigo, and loss of appetite—her health declined, and she soon became emaciated. In a few months after her chest became affected. She had a short dry cough, nocturnal perspiration, chills, and a quick weak pulse, with occasional attacks of hæmoptysis. Her family were much disposed to consumption, and she had lost several with that disease. She was prescribed tonics, and directed to use stimulating applications to the feet frequently. This treatment produced little effect, and several emmenagogues were employed without better success. The Tincture of Cantharides was now resorted to, and given in the dose of twenty-five drops three times a day. On the evening of the second day, pain took

place in the back, with some strangury. On the third day the menses appeared, with considerable pain about the back and hips. In two days more the pain ceased, and the menstrual discharge continued. With the recurrence of the discharge, the pain in the head and other distressing symptoms declined, and the patient in due time recovered her usual health.

The following case, which fell under my notice, will exhibit the emmenagogue power of Cantharides, though the disease with which the patient was afflicted was not removed. This was a woman who had been affected with epileptic convulsions for four years. Her convulsions came on during the menstrual period, and were always aggravated at that season. During the four years that she had been afflicted with convulsions, she had only menstruated four times, and then very slightly. Certain symptoms occurring, such as pain in the head and back, with a sense of weight and uneasiness in the lower part of the abdomen, which indicated a disposition to the recurrence of the menstrual secretion, emmenagogues, as the Ergot, &c. were tried, to induce it. These failing, recourse was had to the Tincture of Cantharides, in doses of thirty drops, repeated three times a day. The three first doses excited such severe strangury that it was deemed most prudent to abstain from the further use of the medicine. Her pulse was much excited, her skin hot, and severe pains in the head came on. Her menses, however, began to flow on the afternoon of the second day, and they continued to flow for four days, when beginning to abate, the tincture was again resorted to in similar doses. This, however, did not produce a return of the strangury. After this free evacuation, her mind was much more correct, and her fits less numerous, and less severe. The medicine was continued at the next period, and with similar results, the discharge continuing several days. From the long continuance of the convulsions, organic derangements of the brain it is presumed had taken place, as the patient did not recover her intellectual functions, nor freed from her epileptic attacks. Had the disease been treated earlier in the same manner, the result, in all probability, would have been different.

In administering this medicine regard should be had to the state of the system, it being adapted to constitutions which have been worn out by debility and long sickness. It should be given in large doses, from 15 to 25 or 35 drops, three times a day. Should strangury be produced, as often happens, attended with much distress, it must be omitted, until the symptoms are relieved, but, during this state, the menstrual secretion will most frequently be excited.

I have alluded to the connection between chronic derangements and the suppression of the menstrual secretion. The several



cases I have related, have been illustrative of the dependance of mania, nymphomania, epilepsy, and phthisis, on that cause. The connection of the first diseases with the state of the menstrual secretion is admitted; but with phthisis, the relation has been overlooked, or not acknowledged. The present occasion is too favourable a one, (though I probably may be digressing,) not to state to you, that, in my opinion, amenorrhœa is often the cause of consumption. The case cited confirms this opinion; and, at all events, it is an interesting subject of enquiry, whether the pulmonary disease is not occasioned by the suppression, and whether in certain cases, amenorrhœa does not prove a cause of phthisis in the pre-disposed? My own views are favorable to this connection, and in the treatment of cases of phthisis as well as some other complaints, would suggest directing the attention to the suppression, as forming the chief diseases, upon the removal of which all the other symptoms will vanish, provided the secretion can be restored, before the lungs have sustained such organic injuries, as to render them incapable of continuing duly to perform their proper functions. Certain it is, that no occurrence is more common, than the attack of cough, pain in the side, difficulty of breathing in females, soon after the obstruction of the menses, and upon its recurrence all these symptoms going off.

The connection derives much support from the knowledge, that the approach of phthisis is generally much more insidious, and its progress more slow in women than in men, and that this difference depends upon its being rather symptomatic, than idiopathic, in females. In other cases, where it arises from some obvious occasional cause other than the catamenia, and to which females are subjected as well as males, its progress is equally rapid and violent. Impressed with this belief, I would recommend, that we keep in view the probable dependance of the pulmonary symptoms, and the other diseases mentioned upon the interrupted functions of the uterus, and direct our treatment accordingly.

But, you will inquire, how are we distinguish those cases in which phthisis is of symptomatic origin, from others? Its symptomatic origin may be ascertained, by the suppression preceding the appearance of the pulmonary affection—and when such is the case, the disease if not dependent, has, at least, an intimate connection with the state of the uterine secretion. Under these circumstances, advantages, I can assure you, will result from re-establishing the discharge.

When phthisis has existed for some time, this secretion, with others, will be deficient, or suppressed, from the enfeebled condition of the general system. So impressed is the female mind, with the general ill-effects of this state of things, that even here, you will often be urged to do something, and advisers will not be

wanting, who will press upon you the necessity of so doing. Here, however, it can be of no advantage, and you will be obliged to resist and combat with much opposition. Do it in this and all other instances, with kindness and forbearance, explain your views clearly, and divested of technicalities, and, from some experience, I am satisfied that you will make your opponents your friends.

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*Family Rubiaceæ—Rubia Tinctorum—Madder.*—This is a perennial plant, and grows wild in some parts of Britain, but is principally derived from Holland, where it is cultivated in large quantities as an article of commerce. The roots are the only part employed, they are long and slender in their structure, being of the thickness of a quill and red throughout, they have a weak smell, and a bitterish astringent taste.

Madder is somewhat remarkable for its effect, in giving colour to the bones of animals, which are fed upon it. It also gives colour to the milk and urine of animals, and from the circumstance of so large a quantity of this substance being introduced into the circulation, it was supposed to be useful as a diobstruent, and calculated to overcome visceral obstructions, particularly of the uterus.

By Dr. Home its employment was advocated in very high terms, and he states that in nineteen cases in which it was employed, fourteen were cured. According to him, it does not shew much sensible operation, neither quickening the pulse, nor disordering the stomach and bowels. It succeeded so well with him that he asserts it to be the safest and strongest of the emmenagogues with which he was acquainted.

Dr. Dewees speaks of it in terms nearly similar, and considers among the advantages of its employment, that it may be given without any particular reference to the pulse or state of the system. He is in the habit of employing it without previous preparation, if applied to near the period at which the menses should have appeared, and it some times succeeds very promptly. This he considers the best time for the use of it, and should it fail then, it rarely is more fortunate afterwards.

By the late Professor B. S. Barton it is spoken of very favorably, and he says that in his employment of the powder of Madder, both in public and private practice, he has observed it to shew considerable effects upon the uterus, and that it is without any hesitation that he speaks of it as a remedy worthy the attention of practitioners. He says, that it appears to be a remedy well suited both to cases of retention and suppression of the menses, but that it is chiefly in the latter condition that he has employed it.

Respectable, however, as are these authorities, and this weight of evidence in its favour, it is employed by few physicians at the

present day, and whatever may be its virtues, it does not possess the confidence of the profession at large, as an article adapted to restore the uterine secretions. Indeed, in my opinion, a substance exhibiting so few active properties, and which, from the mildness of its impression, can be employed under almost any circumstances and without reference to the states of the system, can be little entitled to consideration in a practical point of view. It is not with such instruments that disease is to be arrested, or deficient secretions excited. In proportion to the mischief a medicine is capable of doing when improperly administered, would I estimate the benefits to be derived from it, in the hands of a cautious and judicious practitioner. You have heard the authorities in favor of this article, and may form your own opinions.

The dose is from ʒss. to ʒi. three or four times a day.

*Secale Cornutum.*—This article which has lately been revived, was probably known in Holland so long ago as the year 1747, and in France, where it was interdicted by a legislative act, in 1774. It is probably one of the most important discoveries which has been made in the *Materia Medica*, and when employed under proper regulations, will be found capable of affording relief to suffering humanity, in its most trying and distressing situation. In its operation it comes nearer to the consideration of a specific (a few articles excepted) than is evinced by other substances, inasmuch as it expends its whole force upon the uterus, and exerts little or no action upon the other organs of the body.

*Natural History.*—This article has received a variety of names as *Clavus Secalinus*, *Mater Secalis*, *Secale Cornutum*, *Secale Corniculatum*, *Horned Rye*, *Spurred Rye*, *Ergot of Rye*, *Mother of Rye*.

The term *Clavus* is the scientific term for a disease to which the gramineous plants are subjected; and by the French the term *Ergot* is applied from its resemblance to the spur of a cock. Several opinions have been entertained relative to the nature and origin of the *Clavus*. By some it has been affirmed to be a morbid change or modification of the seed of the rye upon which it is found.

This has been supported by the assertion of Tessier, that he found seeds one-half of which were sound rye, and the other half *Clavus*. By others it has been said to be an excrescence produced by the sting and deposition of the eggs of an insect. Of this opinion was Fontana, Read, Tillet, General Field. In support of this opinion, General Martin Field, of New-York, observed flies puncturing the glumes of the rye during its milky state, he imitated the process by puncturing them with a needle, and found that milk exuded, and the peduncle exhibited in four days a little black point which gradually became a spur.



The only opinion which appears to be well supported is, that the Clavus is a Parasitic Fungus, a species of *Ustilago*, like the different sorts of blight, smut, &c. Of this opinion is Decandolle. It affects most of the Cerealia, but rye seems to be most apt to take on this morbid condition, particularly when the plant grows in low damp situations, and when it is exposed to heat succeeding heavy rains. It is found in greater abundance on the margin of fields than in the central parts.

There are some countries where it is found in greater abundance than in others. It appears to prevail to a great extent in some of the districts of France, particularly the district of Sologne between the rivers Loire and Cher. In this district rye is the common food of the peasantry, and it is found to contain on an average one-eighth part of Ergot even in good seasons. But in bad seasons the proportion has been estimated so high as one-fourth or one-third. The soil in this part of France is remarkable for being level, damp, and the fields particularly affected are such as are newly planted.

The Clavus is externally of a violet colour, and internally white. Its form is cylindrical, tapering at the two extremities, occasionally straight, but generally curved in the shape of a crescent, in most cases with a longitudinal groove, both upon the convex and concave side, though sometimes destitute of it on one or both sides.

Its flavour is at first imperceptible, but after some time it is disagreeable, nauseous, and sub-acrid. If chewed for a considerable time, it produces a sense of fullness in the throat. When taken into the stomach in substance in moderately large doses it occasions nausea; a scruple or a drachm has produced vomiting, but without quickening the peristaltic motion of the alimentary canal.

Very large quantities have occasioned headache and temporary febrile symptoms.

Its most prominent effect is, its direct action upon the uterus, producing and increasing contractions, when there is a pre-disposition to action in that organ, and restoring the catamenial secretion when obstructed.

It must, therefore, be ranked in the *Materia Medica* as a *partus accelerator*, and as an *emmenagogue*.

*Medical History.*—This article, I have observed, was known in Holland and France in the middle of the last century. From the indiscriminate manner in which it was employed, injurious results followed, and we find it prohibited in one of the kingdoms of Europe by a legislative decree. In 1807, its use was revived by Dr. Stearns, of New-York, who was led to make trial of it, from the powerful effects it produced in the hands of some ignorant Scotch women. My information, he says, was such as to impress upon

my mind the necessity of extreme caution in my first experiments. The continued influence of this impression upon my subsequent practice, has been a source of much consoling reflection. It has tended to prevent those fatal consequences which have so often occurred, the nature of which will be satisfactorily explained in the ensuing remarks.

I shall consider the Ergot under a two-fold relation.

1. As accelerating the process of labour.
2. As restoring the catamenial secretions, or its emmenagogue property.

There can be no doubt at present, that this medicine has the power of exerting a specific action upon the uterus—that this action consists in augmenting the contractile power of that organ during parturition, and in lingering and protracted cases, inducing forcible contractions, and expediting delivery. The concurrent opinion of most physicians is decidedly in favour of these effects.

Dr. James in speaking of this article, says, that his experience enables him to speak positively of its powers in this respect—and that the same impression is entertained of it by several of his medical friends engaged in the practice of midwifery.

Dr. Prescott says, that the pains produced by it, when a full dose is given, are very peculiarly forcing, and the contractile effort of the uterus continues to that degree, that the fœtus is not suffered to retreat, but remains forcibly retained, where the last exacerbation of pain left it—until it recurs again. This incessant action will continue for an hour or more, if delivery is not effected, and when it subsides, the medicine given again will reproduce the same effects. These effects are not more extraordinary than the almost instantaneous manner in which they are produced.

In twenty cases, says Dr. Prescott, I carefully noticed the precise time it required to produce its customary operation. In two of them the increased strength of the pains, and the continued action commenced in seven minutes from the time the decoction was taken. In one case it was eight minutes, in seven it was ten, in three eleven, and in other three cases it was fifteen minutes.

From this account of the manner in which the Ergot operates, it may be conceived that it is a powerful agent—that it requires prudent direction—that when properly applied it will be highly useful, many times to hasten a process, which, unaided, would prove extremely tedious and troublesome.

In the employment of an agent so powerful in its operation, certain rules and directions become necessary to prevent any bad consequences which might arise from its use, and which are more particularly proper, as the action when excited is so little under control. The Rules necessary in its administration, are

I. It should never be administered when nature is competent to a safe delivery.

II. It should never be given until the regular pains have ceased, or are ineffectual, and there is danger to be apprehended from delay.

III. It should never be administered until the rigidity of the os uteri has been overcome, and a perfect relaxation induced.

When labour has been protracted from the rigidity of the os uteri, or of the soft parts, these obstacles should be overcome by venæ section—after which the ergot may be usefully employed, and its operation will be found mild and efficacious.

IV. It should never be administered in the incipient stages of labour, nor until the os uteri is dilated to the size of a dollar.

This rule is of the utmost importance, the success of the article being very much influenced by the time when it is employed. When given in the early stages of labour, and before the os uteri is sufficiently dilated and relaxed, it often fails of success. The pains induced under these circumstances, often terminate before the labour is accomplished, and are of no advantage.

The Ergot in its operation upon the uterus seems to have its action directed to particular parts of that organ. For instance, the contractions which it excites have no tendency to enlarge the os tincæ, and if given while the mouth of the uterus is contracted, violent pains are excited without rendering labour at all more speedy. Its force seems directed upon the fundus, and the contractions excited are only beneficial when the soft parts are fully dilated and relaxed.

V. It should never be administered in any case of Preternatural Presentation, that will require the fœtus to be turned. The necessity of this caution will be obvious, when it is considered that the violent and forcible contractions induced, will add much to the difficulty and hazard of the operation.

With these precautions in the use of the Ergot, it may be safely and effectually used, and the relief afforded will, from the united testimony of those who have written on the subject, be gratifying in the highest degree. Without a regard to these rules, the most mischievous consequences will result, and an article capable of serving many valuable purposes, will be neglected and abandoned.

Having premised the rules which are to be observed in the administration of the Ergot, I shall proceed to consider those cases in which it is necessary to have recourse to it.

1. The Ergot is indicated in those cases, where the expulsion of the child is delayed from the action of the uterus being weak and ineffectual,—where it has descended into the pelvis, and the soft parts are prepared for its passage. Any delay to its expulsion when in this situation, would be attended with danger to the mother from pressure on the soft parts, or from the exhaustion of strength and vital energy, which might ensue from hæmorrhage,



or other alarming symptoms. In these cases, the action of the Ergot, by renewing the uterine contractions to a considerable degree, speedily effects delivery.

2. When the pains are transferred from the uterus to other parts of the body, or to the whole muscular system, as in puerperal convulsions. In these cases, Dr. Stearns observes, that after copious blood-letting, the Ergot concentrates all these misplaced labour pains upon the uterus, which it soon restores to its appropriate action and the convulsions cease.

The beneficial effects of this practice is also confirmed by Dr. Waterhouse, who in a case of violent puerperal convulsions, accompanied with dilatation of the os uteri, succeeded by employing the Ergot, in restoring the pains to the proper organ, in a manner almost instantaneously, he says, and truly astonishing.

3. When in any of the stages of pregnancy, abortion becomes inevitable from hæmorrhage. Cases complicated with hæmorrhage, call forth all the decision and energy of the medical character. Their management is connected with much hazard to the mother, and to the physician a scene of trial and difficulty. Under these circumstances to know that we possess a remedy, the action of which tends to restrain the hæmorrhage, must be attended with consolatory reflections.

The indication to be fulfilled, is to excite the uterus to contract and to expel its burthen, as by this means only, the hæmorrhage can be arrested. The Ergot, from its action upon the uterine fibres, presents itself as a remedy suited to these purposes. It must be given to the extent of exciting contractions, and when these are produced, the flooding will commonly cease.

The efficacy of this article is confirmed by Dr. Prescott.

4. The Ergot is indicated in cases of labour, complicated with uterine hæmorrhage. The same remarks as in the preceding, are applicable here. The hæmorrhage must be stopped by plugging the vagina, the use of cold applications, &c., until the os uteri is dilated, when the Ergot may be tried with safety and effect.

5. Where the placenta is retained from the want of action in the uterus—I have seen several instances of the beneficial application of this article in such cases, and from all that we know of its operation, the Ergot will be well adapted to effect its expulsion.

6. The Ergot will be beneficial in cases where hæmorrhage occurs after delivery. It occasionally happens, that the uterus, from the want of tone, does not contract after the delivery of the child and secundines, in consequence of which, flooding is very apt to ensue. This is what has been called relaxation of the uterus, and is a state of extreme danger. It may be known by the abdomen being large and flaccid, and the uterine tumor not being perceptible above the pelvis. In these cases the Ergot

will be found very efficacious, and in a short time excites contractions of the uterus.

I cannot conclude this summary of the beneficial effects of the Ergot, without stating to you the opinion of Dr. Dewees on this subject. It would appear, he says, from all I have been able to collect, and from all I have observed, that it rarely fails, or disappoints, when properly prescribed.

To counterbalance these beneficial effects of the Ergot it has been alleged, that more cases of still-born children have occurred since its employment, than where recourse is not had to it. In the accounts which impute the death of still-born infants to the Ergot, we do not find that minute detail of symptoms, of the quantities given, of the times and circumstances of its exhibition which are necessary to enable us to form a correct opinion of the propriety of the practice.

There can be no doubt that without a regard to the rules I have stated, the Ergot will produce injurious effects, but used with caution as far as the experience of those who have employed this article will warrant the conclusion, I may safely say that the above assertion is unfounded.

In the cases where death occurred, other circumstances attended, which fully exculpate the Ergot from any agency in the event. When too it is considered that recourse is only had to the Ergot in tedious and protracted cases, it will not be unreasonable to suppose that an unfortunate issue should happen more frequently, or in greater proportion to the whole number of cases, than might reasonably have been expected, had this medicine not been prescribed.

Of the manner of exhibiting the Ergot in parturition. It does not exert as beneficial effects when administered in powder as in decoction. In this latter form it is prepared in the proportion of ʒss. of the Ergot to iv. ozs. of boiling water, and of this 1-3 is taken at a time. If the pains are not sufficiently severe in twenty minutes, half of the remainder is to be given—and the last dose if necessary, but this is rarely the case. While this quantity produces its most favorable effects upon the uterus, it does not affect the stomach with nausea or vomiting, which sometimes interrupts its successful operation.

It may be given also in the form of the Oil of Ergot. The dose is from 10 to 20 drops in warm tea, or weak spirits and water.

The Oil is given in the same diseases in which the substance has been recommended. It possesses some advantages, inasmuch as it can be kept for a length of time, and its activity be undiminished.

I have thus given you as general a view of the operation of this

article as my limits would admit. I have presented you with an account of its effects, of the circumstances under which it should be administered, and of the cases to which it is best adapted. That this article when improperly employed may have done mischief, I will not deny, and the same may be said of every other active agent, but with a knowledge of the time, and the circumstances when it ought to be employed, you may hereafter discover that a judicious use of it will save you from much embarrassment, and be instrumental in preserving the lives of both mothers and infants. That such may have been its effects when properly and discreetly used, we have the most satisfactory reason to infer, not only from the experience of many practitioners with it, but from the peculiar properties and operation of the Ergot.

Besides the cases already mentioned, in which Ergot may be successfully resorted to, it has been employed in profuse discharges of the Lochia, in Menorrhagia, by several persons, and by myself with very gratifying results, and in hæmorrhages from other organs.

I now proceed to the second division, or the consideration of its emmenagogue property.

Upon this subject there exists a contrariety of opinion, some maintaining such a power in the article, and others denying it. My own opinion derived from some experience in the Alms House in Philadelphia and at home, is decidedly favourable to the beneficial operation of the Ergot in this particular. We should a priori be disposed to admit such a property, from the strong and decided determination of the Ergot to the uterus—but preferring facts and authorities to speculations upon the subject, I shall avail myself of such information as is to be found in the journals of the day.

The strongest authority in favour of this article is Dr. Randall, of Boston, who has recorded several cases successfully treated. The case, he says, in which he gave the greatest quantity of Ergot was one of Amenorrhœa, and happened about three years since. The quantity taken was about six ounces. The patient was furnished with the Ergot at two different times—two ounces at first and four the second time.

The medicine was prepared with a quart of water to  $\mathfrak{z}\text{i}$ . of Ergot, boiled down to a pint. The first quantity or the  $\mathfrak{z}\text{ii}$ . was taken in five days—but the second, from the great solicitude for relief, was taken in four days, so that an ounce in decoction was taken in a day. The patient was relieved, no unpleasant effects occurred at the time, and she has remained in perfect health ever since.

The next case was Mrs. T. She has taken the Ergot for amenorrhœa at three different times at the rate of  $\mathfrak{z}\text{iv}$ . a day. An



ounce relieved her the first, the same quantity the second, and two ounces the third time. No dangerous symptoms happened to her on any of these occasions, and she has enjoyed as good health since as she ever did before.

Dr. R. gave an ounce per day to another person for four successive days, without any ill effects, but without giving the relief required.

Four other persons by his direction have taken an ounce each in the quantity of  $\zeta$ ss. a day, with perfect relief and without injury. We have thus an account of six cases in seven being relieved by the Ergot—a degree of success which would entitle any article to the reputation of an emmenagogue. The cases also shew the great extent to which the Ergot may be given in the unimpregnated state of the uterus, without any other injury than the temporary inconvenience which occurs at the time of exhibition.

The infusion as well as the decoction appear to extract all the active properties of the Ergot, and both are more speedy in their operation than the powder.

The next case is related by Dr. Church in the fifteenth number of Chapman's Journal.

This was the case of a lady who had a suppression of the menses from cold for five months. She complained of pain in the breast, a dry cough, her bowels were in a torpid state, and she was much emaciated, weak and languid, her pulse preternaturally slow, but a little excited in the evening. She had employed all the usual remedies for the disease. Dr. Church commenced with evacuating the alimentary canal, and directed the bowels to be kept regular. The patient was directed to take two table-spoonsful of the decoction of Ergot three times a day. She persevered in the use of the remedies about a month, when the catamenia returned, and she became regular. The cause being removed, all her phthisical symptoms disappeared.

The authority of Dr. Waterhouse might also be adduced in confirmation of the beneficial effects of the Ergot in these cases. For an interesting case see New-England Journal.

To these proofs of the emmenagogue action of the Ergot, I may add, that I have employed this article on several occasions, upon females labouring under obstruction of the catamenia. The particulars of these cases would furnish nothing new, but the conclusion drawn from these trials was decidedly favorable to the emmenagogue power of the Ergot.

It may be given in powder in doses of 15 or 20 grains three times a day—or in decoction in the manner mentioned. I have been more particular than perhaps would appear necessary in my description of this article—but it is confessedly one of great power,

and on that account requiring particular directions in its administration—as without attending to the rules which have been pointed out, mischief rather than benefit might arise from its use. When doubts have arisen respecting its power to alter the action of the uterus, they may have been excited in consequence of the article not being obtained in an unimpaired state.

*Morbid Effects produced by the Ergot.*—For some time doubts have been repeatedly expressed upon the morbid effects of this article upon the system, and endeavors made to controvert the impression of its exerting a baneful influence. These doubts were in part removed by tracing the connection between the poison and the diseases said to be produced by it, and still further by experiments on animals.

From the experiments of Dr. Robert, of Berlin, upon animals, and from the observation of various authors, it appears that it is injurious and even fatal to all animals which are fed for a sufficient length of time with a moderate proportion of it, unless they escape its action by early vomiting.

That dogs and cats in consequence of discharging it by vomiting, suffer only slight symptoms of irritant poisoning—but that swine, geese, ducks, fowls, quails, sparrows, are sooner or later killed by it.

The symptoms it causes in beasts or birds, are giddiness, dilated pupil and palsy, afterwards diarrhœa, suppurating tumors, scattered gangrene throughout the body, and sometimes dropping off of the toes.

In the human subject when taken in a very large dose, it produces distressing symptoms.

But this is not the way in which its usual bad effects are produced. It is when it has been mixed with meal, and taken in bread, as food for a continuance of time. Two distinct set of symptoms have been noticed.

The one a nervous disease, which is characterised by violent spasmodic convulsions, called by the French, Convulsive Ergotism.

The other being a depraved state of the constitution, which ends in that remarkable disorder, dry Gangrene; also called Gangrenous Ergotism—Creeping Sickness, &c., from its being preceded by general weariness, weakness, and a feeling of insects creeping over the skin, followed by a numbness of the feet and toes, which, in a short time, become shrivelled, dry, drop off—and the two affections are not apt to be blended together in the same case.

REFERENCES.—*American Medical Recorder*, No. XX.

*Christison on Poisons.*

*Silliman's Journal*, Vol. II. No. 1.

The *Tincture of Guaiac* has been recommended in very strong terms in amenorrhœa and dysmenorrhœa, by Dr. Dewees, of Philadelphia. His success with it has been so considerable, that he has pronounced it a specific in these cases, and employs it almost to the exclusion of every thing else. The Professor of Obstetrics, I believe, has explained the views of Dr. D. on this subject, and its application, I shall therefore not enter upon it. It may not be amiss to mention the formula employed, as it differs from the tincture of Guaiac of the shops—It is as follows

℞. Powdered Guaiac, ℥viii.

Powdered Pimento, ℥ii.

Carbonate Soda or Potash, ℥iii.

Alcohol diluted, ℔ii. m. and digest for two or three days.

The dose is a tea-spoonful three times a day in a wine-glassful of water or milk. The Volatile Spirits of Ammonia is added, in the proportion of ℥i. to ℥iv. of the tincture. Should it operate upon the bowels, a few drops of Laudanum may be given.

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*Stimulating Injections.*—Under the head of Stimulating Emmenagogues may be mentioned the employment of Ammonia, in the form of injection into the vagina. This practice has been proposed by M. Lavigna, an Italian gentleman, and he gives fourteen cases in which this treatment succeeded, sometimes in twenty-four hours, and at most in five or six days, to produce the discharge. The same success was experienced in all temperaments; plethoric, bilious, pituitous and their complications. The proportion used was x. or xii. drops of Ammonia, in two table-spoonful of warm milk, often repeated in the course of the day. It generally produced in the vagina a sensation more or less painful, according to the strength of the mixture, and the sensibility of the part, but in no case was any thing dangerous or troublesome produced. Upon this practice I cannot make any comments, having never employed it, but by some of the foreign journals it is spoken of very favourably.

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*Electricity.*—It is natural to suppose, that a power of such energy as Electricity, would be applied to medicinal purposes, especially since it has been found invariably to increase the insensible perspiration, to quicken the circulation of the blood, and to promote the glandular secretions.—Accordingly, many instances occur, in the later period of the history of this science, in which it has been tried on various occasions, with considerable advantage and success. In most of the cases in which it has been used with perseverance, it has given at least temporary and partial relief—in many effected a cure. Of its utility in amenorrhœa, there is not wanting the weight of high authority, and the expe-



rience of many in this city, who have employed and recommended it.

Dr. Cullen in speaking of this subject says, that one of the most powerful means of exciting the action of the vessels in every part of the system, is the electric shock, and it has been employed with success for exciting the vessels of the uterus.

Cavallo after enumerating various diseases in which electricity has been found useful, distinguishes its importance in those to which females are especially liable. With Dr. Cullen he considers amenorrhœa, though of long standing, and even after the most powerful medicines have been unsuccessfully employed, to be effectually cured by the agency of electricity, and says that the cases of this sort, in which electrization has proved useless, are so few, and the successful ones so numerous that the application of electricity for this disease may be considered an efficacious and certain remedy. Its operation in promoting the glandular secretions, seems to be by its mechanical stimulus, and it has this great advantage, that it may be directed to any particular organ. Thus applied it does not merely promote any discharge or circulation of fluids, but assists the *vis vitæ*, or that innate endeavor by which nature tends to restore the sound state of the injured part of a living animal. It may perhaps be difficult to explain in what manner electricity assists this natural endeavor, but experience shews the certainty of the fact, and with it we must be contented, for we may apply the effects to our wants, though we are ignorant of its mode of acting.

But it is not reasoning only, or the opinions of individuals that I shall urge in support of the utility of electricity as an emmenagogue. I shall present you with the result of its application in forty-nine cases which were under the care of the late Dr. Shecut, a physician of this city, who has had greater experience with this remedy, in its application to diseases, than any person, I believe, in the United States. Of forty-nine cases which were submitted to electrical treatment, thirty-four of them were effectually cured, and the remaining fifteen were relieved from their most distressing symptoms. More of them might have been cured, for he adds, that it is too common with patients when they find themselves relieved, in order to avoid expense, to trust to nature for the rest.

In bringing before you this statement, I should observe, that such is the dread entertained by females of electrical shocks, together with the trouble of being carried to the machine, that it is seldom resorted to until medical treatment has been practised to some extent—so that I may say the usual remedies had been unsuccessfully employed. In confirmation of the utility of electricity, I am acquainted with a lady of this city who for six years laboured under a suppression of the menstrual secretion, in whom to the

ordinary distressing symptoms, were added such strong convulsive paroxysms, as to render the approach of her monthly periods the occasion of great dread and painful forebodings to her friends. From her situation in life, the first physicians were employed, and every expedient which medical skill suggested, was united with the utmost care and assiduity in its execution. They were all unavailing, the paroxysms, and the morbid derangements still continued, and the patient's constitution became at every period, more and more enfeebled. Her existence seemed nearly to have been extended to its utmost limit, and death, I may say, had already marked her for his own. In this situation electricity was proposed, and from the extreme feebleness which existed, apprehensions were entertained that the necessary shocks would be too severe. They were submitted to, however, and the first application was found useful in abating the severity of the symptoms, a few repetitions seemed to unlock the secretions which had so long been retained—with the discharge every unpleasant symptom disappeared, and at this day the lady enjoys a large share of health. So complete a triumph as was thus exhibited, deserves not only to be recorded, but to be remembered. Its application being connected with so many minute directions, which can best be exemplified upon the machine, that I must refer you to the Professor of Chemistry.

Another case of spasmodic disease closely resembling catalepsy, fell under my notice, in which the benefit conferred by electricity, was conspicuously manifested. This lady had for a length of time been afflicted with violent headaches proceeding from the irregularity of the uterine secretion, and for the relief of which a variety of remedies had been employed. The headaches became more violent, and finally terminated in a degree of vertigo, to which succeeded rigidity of all the muscles of voluntary motion, and that to such a degree that the limbs could not be changed from the position in which they chanced to be placed, before the spasm came on. In this situation she would remain two, four and six hours at a time, in the condition of one asleep, the features no ways distorted—the breathing soft and easy, uninterrupted by sighs, stertor, or any indication of oppression. The pulse during these attacks varied much in its character.

Every course of treatment which could be devised, was employed during the space of two or three years by skilful physicians in succession, and with little apparent benefit. Finally, when all medical treatment seemed unavailing, I advised recourse to electricity. She was therefore conveyed to a machine of great power, where arrangements had been made for the reception of patients. So frequent were these spasmodic attacks, and so readily excited by the slightest causes, that fears were entertained of

their recurrence while carried to the machine. Such really was the case on the first visit, and soon after being placed upon a settee previously to the application of the fluid, an attack of spasms resembling catalepsy occurred. The operator was not deterred, but attaching a wire from the pole to a part of the body, shocks were directed through different parts of the system.

The effect was really surprising, for scarcely had a dozen been communicated, when the spasm was completely relaxed, and a rigidity which would have continued some time, upon the most favorable calculation, was thus removed in a few minutes.

The influence of electricity upon the secretions was particularly exhibited. The patient had never noticed the slightest degree of moisture upon the surface, yet, during the operation, the skin was covered with considerable sensible perspiration. The shocks were repeated every other day for weeks, with very obvious relief to the spasmodic affection, and soon with the appearance of the catamenia. The quantity though small, was much more considerable than it had been since her disease, and it continued to increase. The paroxysms declined in like manner, and such the amendment which her system has experienced, that these cataleptic attacks have been very few, and of short duration, since that period, though several years have elapsed. The above effects of this agent, with the cases cited, induce me to recommend it strongly to your attention.

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Emmenagogues of minor importance, but which, from their general employment, deserve a place, may be considered, the *Rosmarinus Officinalis*, or *Rosemary*, and the *Mentha Pulgium*, or *Pennyroyal*.

The *Rosemary* was formerly much used. It is a perennial plant, growing wild in the south of Europe, and is cultivated in this country in gardens.

It has a fragrant smell, and a warm, pungent, bitterish taste. It is much in use as a domestic remedy for suppression of the catamenia, and it would appear, from the testimony of several respectable writers, that its powers as an emmenagogue are not inconsiderable.

By some it is spoken of in terms of considerable commendation; and is said to be an article of much value, having been used in several cases with success. It is favourably spoken of by Bergius.

It is given in the form of a strong infusion or decoction, in doses of a tumblerful for three successive nights and then suspended.

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*Mentha Pulgium*.—This plant grows in every part of our country, and is nearly allied to the former. It, as well as the preceding, are popular remedies, and is given in the form of a



strong infusion at bed-time. To which is commonly added the pediluvium. In recent cases this practice is of benefit, and is generally resorted to before professional aid is called upon.

#### EMMENAGOGUES WHICH ARE TONIC IN THEIR OPERATION.

With these articles I complete the consideration of the Stimulating Emmenagogues. Amenorrhœa will often be found connected with a debilitated condition of the system, and therefore demanding tonics; experience having often shown that those expedients and medicines which restore the strength of the constitution, have the effect of re-producing the discharge.

The preparations of Iron have long been considered among the most useful and valuable remedies in these cases; and a number of facts could be cited, of their utility in diseases which proceed from atony of the general system, in cases of feeble re-action, and of languid and imperfect operations of the functions generally. They have, therefore, been employed in a variety of cases, which will be more particularly considered at a future period.

In the state of system which is at present under consideration, few articles can be more beneficial. Not only are they of use by the impression which is made upon the animal fibre, but by being received into the circulating system, the energies of the heart are greatly increased, the pulse is rendered more full and strong, greater energy is afforded to the animal functions, secretions renewed, and health restored.

With these changes the process of assimilation is better performed, a more healthy chyle elaborated, nutrition advances, and hence, to an increase of vascular action, is added an increase in the bulk of the body.

Of the preparations which have been most esteemed.

The *Protoxide, Rust, or Carbonate of Iron*, deserves first to be considered. It is prepared for medicinal purposes by precipitation. With this view a solution of the sulphate of the protoxide of Iron is formed, which is treated with carbonate of Soda—the protoxide of Iron is thrown down. It is to be dried quickly, and kept in bottles closely corked. Without this precaution it is converted into the sesqui oxide, which is not soluble.

This is one of the mildest preparations of Iron, and is much resorted to. It is obtained in a finely divided state—is inodorous and insipid. The dose is from x. to xv. grains.

It is seldom given alone; but combined with bitters and aromatics, with a view to improve their action, and to lessen the distaste which arises from its uncombined administration.

The following formula will be found a useful mode of exhibiting this article.

R. Powdered Cinchona, ʒss.

Powdered Ginger,

Protoxide of Iron a ʒii. mix and divide into viii. or x. powders. A powder to be taken two or three times a day.

Or the mass may be made into an electuary with syrup.

A better and more agreeable formula, is the Chalybeate Wine, prepared as follows:—

R. Protoxide of Iron, ʒiss.

Orange Peel,

Gentian Root, each ʒss.

Port Wine, ℥ii.\*

These ingredients are to be bruised and then put into the Wine, and exposed to a moderate heat, either in the rays of the sun, or near the fire for two days, being shaken occasionally. This is then to be decanted and given in the dose of two-thirds or half of a wine-glass several times a day.

This formula I have frequently employed, and would recommend it to you, as pleasant to the stomach, and highly beneficial in its operation.

In the constitutions submitted to our care, under this condition of the system, much attention is required, in adapting the prescriptions given, to the excitability, and so compounding your medicines, that, exciting but little disgust, their use may be persisted in, until the object intended is accomplished.

The *Sulphate of Iron* is another preparation employed in the same cases. It entered into the composition of Griffith's Myrrh Mixture, which was at one time much used in this and other diseases, but which is little employed at the present time—as this preparation frequently nauseates the patient, or is otherwise unpleasant, the following may be substituted for it with advantage.

R. Sulphate of Iron, ʒi.

Gum Myrrh, ʒi.

Sub carbonate of Pot, ʒi.

Refined Sugar, ʒii.

These are to be well rubbed together, and during the trituration, add, gradually,

Rose Water, ʒviiss.

For the purpose of rendering it more agreeable

Spirit of Nutmeg, or other

Aromatic may be employed.

The mixture when prepared should be placed in a bottle and kept well corked. The dose is ʒss. to ʒi.

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\*The wine will act but feebly on the iron, except where it has been recently prepared by precipitation.

This will be found a useful tonic, and well adapted to that state of the system which is under consideration.

The Sulphate of Iron is frequently given in the form of pills, combined with the vegetable bitter extracts, as Bark, Gentian, &c. or with Myrrh to increase its emmenagogue operation, and may be united to an infusion of Quassia, or Colombo. These articles being particularly preferred, as in consequence of their containing little or none of the astringent principle, their colour is not changed by the addition of the salts of iron.

℞. Sulphate of Iron, ℥ii.

Ext. of Gentian or Bark, ʒi. —m. ft. Pil. xx.

*Ferrum Hydriodatum*—*Hydriodate of Iron*.—Has been recently recommended by Professor A. T. Thompson, of the London University, in very high terms, in many of the diseases in which this class of remedies is employed. For the preparation I will refer you to the systems of Chemistry.

In doses of three to five grains it acts as a gentle stimulant to the stomach and bowels, improving the appetite and digestion, and promoting the alvine evacuations in a very gentle manner. From the principles entering into its composition it has been considered useful in those cases where to augmented activity in the capillary system a tonic operation was also required, particularly in scrofulous affections, as in tabes mesenterica, chlorosis, incipient scirrhus, amenorrhœa, atonic dyspepsia, in hæmorrhages, in which it seems particularly useful, from its tendency to produce coagulation of the blood. It is given in substance in the dose of iii. to v. grains, two or three times a day, or may be given in solution, as follows—

℞. Hydriodate of Iron, g. xxiv.

Distilled Water, ʒi. —m. an ordinary tea-spoonful, containing about iii. grains.

### *Muriated Tincture of Iron.*

*Nitrate of Iron*—*Solution of Nitrate of Iron*—*Persesquinirate of Iron*.—Preparation. It resembles the solution of the muriate of Iron in its medicinal properties. To an astringent power, it unites the property of diminishing the irritability and tenderness of the mucous membranes with which it comes in contact.

It has been considered particularly useful in cases of chronic diarrhœa which had resisted other remedies. Its use must be continued some time.

It is given in doses of gtt. x. several times a day in barley water, and the quantity may be increased to xx. or xxv. gtt.

### *Lactate of Iron.*



A variety of other means are usually resorted to, to restore the tone of the system, but they can scarcely be called emmenagogue. It may be proper to mention them here. They are exercise in the open air, a very powerful means of strengthening the system, and with particularly good effects, if the lower limbs can be much employed, as in walking, riding on horseback, &c.—The cold bath of the temperature of 50 or 60° Fahrenheit—frictions to the lower extremities, and lastly a cordial and strengthening diet, which, if properly directed, and caution observed with respect to quantity, so as not to oppress the digestive organs, I would rank among the best of tonics.

#### EMMENAGOGUES WHICH DIMINISH ACTION.

Having considered the Stimulating Emmenagogues, and those which give tone to the system, under their separate divisions, I now proceed to those the operation of which is to diminish the action of the system. The suppression of this secretion is often found occurring in full phlethoric habits, with much arterial excitement, flushed face, inflamed eyes, and pains in various parts of the system. Depleting remedies, under these circumstances, are the best emmenagogues, and of these venæ section holds the first rank. The uterus, in habits of this description, may be considered as partaking of the same plethoric and inflammatory state, and the action to be carried to such a degree, as to transcend the point of secretion. Here then venæ section becomes an excellent remedy, and many instances might be adduced of its success in restoring the discharge. It acts by removing the plethoric state of uterus, relaxing the fibres, and giving to the vessels their due action, by which the evacuation takes place. By being properly employed it prevents vicarious hæmorrhage in the brain, the lungs and other organs.

To this we must add other means of depletion.

Cathartics may be considered as next in value. For the purposes of depletion any of them may be employed—but of those which have been most celebrated I shall select a few.

*Family Ranunculacæ—Helleborus Niger—Black Hellebore.*—This plant grows wild in the mountainous parts of Switzerland and Austria. The root is the only part used in medicine, and consists of numerous black fibres, springing from knotty branches, which issue out of a central radical tuber.

#### *Description of the Plant.*

The root consists of numerous depending fibres, issuing from a rough, transverse, knotty head, externally of a blackish colour, internally white.

Leaves—large, consisting of five, six or more leaflets, of a deep

green colour, springing directly from the root, on long cylindrical petioles, smooth and dotted with red. The leaflets are ovate, lanceolate, smooth, shining, coriaceous, slightly serrated.

Flower-stalk—a scape six or eight inches long, erect, round, variegated with red, supporting one or two flowers.

Corolla—five large, roundish, concave petals, at first white, or of a pale rose colour.

Filaments—numerous.

Germens—about six or eight in number, become pods, containing many black, shining seeds.

This plant was supposed to be the true *Helleboros Melas* of Dioscorides, until it was discovered to be a distinct species by Tournefort, growing plentifully on Mount Athos, Delphi, Bythinian Olympus, as well as the hills near Thessalonica.

The taste of Hellebore is acrid and bitter. Its acrimony is first felt on the tip of the tongue, and then spreads over that organ—the fibres are more acrimonious than the head of the root from which they issue.

The Hellebore is probably one of the most ancient remedies of which we have any description—it having been used by Melampus, as a purge, upon the daughters of King Prætus, who were afflicted with melancholy. It was much celebrated by the ancients for the cure of maniacal and other disorders proceeding from what was called *atra bilis*, and was given in such doses as proved strongly cathartic. Its effects, under these circumstances, were often extremely violent, and it would appear from the descriptions we meet with, that a cure was not expected without producing symptoms of a violent character. It is, however, considered that the black hellebore used at present, is not so violent in its operation as that employed by the ancients, whence it has been supposed to be a different plant. Certain it is, that the descriptions the ancients have left us of their hellebore, do not agree with any of the sorts usually noticed by modern botanists.—*E. Dispen.*

It is, however, as an emmenagogue that it is chiefly employed at present, in which character it was strongly recommended by Dr. Mead.

It is especially useful in plethoric habits, accompanied with torpor and constipation of the bowels, as in its operation it determines to the pelvic viscera in a considerable degree. This is indicated by the sense of weight and pain which patients generally experience after taking it several days—the determination being often so great as to produce a profuse hæmorrhage from the uterus.

Such was the reputation it sustained, until denounced by Dr. Cullen, who says that in many trials he has never found the emmenagogue virtues of this medicine, neither has he met with any

practitioner who had any better success. It is, however, regaining its place, being extensively used in Europe. By the late Drs. Barton and Kuhn, of Philadelphia, it was considered as among the most powerful of the emmenagogues.

It is administered in the form of powder and tincture. The dose of the former is ten grains, in divided portions through the day.

The tincture is the best mode of exhibiting it, as the proof spirit contains the whole virtue of the hellebore, and seems to be one of the best preparations of this medicine in these cases. The dose is xxx. drops increased to  $\mathfrak{z}\text{i.}$ , as long as the stomach can bear it without nausea or vomiting.

Notwithstanding what has been said of this medicine, it is a dangerous and drastic remedy. It has been tried in the affections I have spoken of, but in these, less violent, more manageable, and certain remedies of the same class are equally effective.

It is very rarely, and ought never, I should say, to be used.

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Aloes and its preparations have been much used in these cases. Having already spoken of the natural history and operation of this article, it is unnecessary to dwell long upon it. In small doses frequently repeated, it not only cleanses the *primæ viæ*, but promotes the uterine discharges.

It is seldom given alone, but is combined with various other articles, or administered in the form of tincture.—Of these preparations the most celebrated, is the

*Elixir Proprietatis*, or *Compound Tincture of Aloes*.—It is prepared in the following manner—

R. Powdered S. Aloes,

Fine Saffron, a  $\mathfrak{z}\text{iii.}$

Tincture Myrrh,  $\text{℥}\text{ii.}$ .—digest these a due time, press off the liquor, and filter for use. The dose is  $\mathfrak{z}\text{ss.}$

This is a warm, active, and stimulating cathartic, and is much employed in catamenial obstructions.

In the state of the constitution under consideration, I have commonly been more successful, by administering x. to xv. grains of calomel at bed-time, and in the morning, following up its operation with a dose of the tincture.

This practice is to be repeated two or three nights, and will often be found beneficial.

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*Mercurial Preparations*.—Before concluding the class of Emmenagogues, it may be proper to say a few words respecting the preparations of Mercury. These are sometimes useful, not only for their evacuant operation, but to renew secretions. For the latter purpose they should be employed to the extent of producing



a slight salivation, which is to be kept up for two or three weeks, and this aided by the use of blisters, placed high up on the inside of the thighs, has been found efficacious after other means have failed, and in very obstinate cases should doubtless be resorted to. By this mode of treatment the deranged actions of the system are counteracted and completely broken up by the operation of the mercury, while a degree of action is communicated to the part more immediately diseased by the local impression of the blisters.



## DIVISION XI.

### SIALAGOGUES.

THE next class of medicines of which I shall treat is that termed Sialagogues, by which is meant such articles as have the effect of exciting an increased discharge of saliva. The title is an objectionable one, when considered in connection with the substances treated of under this head, as it is erected upon an effect which in most cases is incidental, and which, in many instances, is not necessary to the cure of diseases. I shall retain it, however, as it has been by preceding writers on the *Materia Medica*, keeping in mind that the term does not embrace the principal operation to be considered, in the medicines arranged under this head.

The substances which operate upon the salivary glands, so as to excite them to pour over their fluids, in increased quantities are of two kinds. Those which may be called External or masticatories, and which when applied within the mouth, stimulate the excretories of the saliva, and the mucous glands; and those administered Internally, and which operate through the medium of the circulation.

It seems to be a salutary provision of nature, that when any acrid matter is applied to the sensible parts of the tongue and the internal surface of the mouth, a quantity of saliva and mucous should be poured out to wash it off, or defend those parts from its irritating effects. Whence by the continued application of acrid substances, a considerable evacuation of the vessels of those parts is produced. By emptying the salivary glands and mucous follicles, an afflux of fluids is excited from all the neighboring vessels to a considerable extent. Whence it will be readily understood, that these masticatories may relieve rheumatic congestions, not only in the neighboring parts, but also inflammatory dispositions in any part of the head supplied by the branches of the carotid artery. They will also be found by their stimulating qualities to be

of considerable advantage in paralytic affections of the tongue. Many substances are resorted to for this purpose, and chiefly the warm acrid vegetables. Indeed every substance that proves sharp and heating to the tongue, or internal surface of the mouth will answer this end,—as the angelica, horse radish, tooth-ache bush or *zanthoxylum clavi hercules*, *polygala seneka*. Yet as they are not resorted to very frequently for practical purposes, they need not be considered in this place.

Of the internal sialagogues, mercury is the only one capable of exciting a flow of saliva, and the only one that can be confided in.

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*Mercury—Hydrargyrum.*—Natural history of Mercury. It is an opaque silver coloured metallic fluid, appearing to the eye like melted lead, solidified by extreme degrees of cold, and capable of being evaporated by a heat below ignition. It is found in the bowels of the earth sometimes pure, and is called Virgin Mercury, but most commonly it is combined with sulphur, or other earthy matters, from which it is purified by processes to be explained by the Professor of Chemistry. The principal mines of quicksilver, of which we have any account, are in Spain, Hungary, Peru, and considerable quantities are brought also from the East-Indies.

*Medical History.* This fluid, supposed by the Greeks to be poisonous, urged its way into practice with considerable difficulty. Thus, Dioscorides ascribed pernicious effects to it as a medicine, and the elder Pliny declared, that it had the quality of poisoning all things. These opinions of the nature of Mercury, influenced Galen to consider it highly corrosive, and to rank it among the poisons. The writings of Galen, circulating among the Arabians, the correctness of these opinions became questioned, and we find their most distinguished physicians, as Rhazes, and Avicenna, introducing it into medicine, as an ingredient in external applications in different cutaneous diseases. Shortly after this period, Avicenna having observed, that even when taken internally, it caused no injurious effects, and that by its weight, it made a free passage through the bowels, the practice became common to give it largely in affections of the Intestinal canal, and in cases of difficult labour.

The researches after the philosopher's stone, and the chemical doctrines, being coeval with this period, we find mercury occupying the principal attention of the philosophers of that sect, and being the substance upon which their hopes were chiefly directed. It was accordingly, subjected to a variety of processes, and in the zeal for discovery, its properties became better known.

The practice of the Arabians, was followed by some physicians in Europe, towards the end of the thirteenth century, but was not established or looked upon, in general, to be safe, until about

the beginning of the sixteenth, when the venereal disease making its appearance in Europe, was found to yield to mercurial preparations alone. By the bold and vigorous use of them, Paracelsus and Van Helmont, made known a practice far more successful than any of their predecessors, and contributed very much to extend the reputation of this article. Being found so efficacious in the venereal disease, its use began to be ventured upon in other complaints. To Dr. Chisolm in the West-Indies, and the physicians of this country, we owe its extensive use in malignant fevers, and the diseases of warm climates.

*Chemical History.* In its crude state, it produces no perceptible effect on the body, and is without any sensible acrimony, taste or smell, yet it may be rendered active, by changes in its chemical state, or additions to its substance. When rendered thus active, it seems to be a stimulus to every sensible and moving fibre of the body to which it is applied. The degree of its stimulant impression, is modified in a very remarkable manner, by the different preparations of it which have been proposed and employed.

In consequence of the changes which it undergoes, by its numerous preparations, it is not only a powerful stimulant, but it enters the circulation, quickens the vascular action, excites powerfully the whole glandular system, and increases all the secretions and excretions. Hence, it happens, that its various preparations produce different effects, operating sometimes as stimulants to the general system, or as cathartics, emmenagogues, errhines, &c., and hence it becomes useful in a great variety of diseases, such as febrile affections, cachectic diseases, glandular obstructions, and cutaneous eruptions.—*Francis' Inaugural Dissertation.*

The value of these preparations may be inferred from this circumstance, that during a period of 300 years, experience has fully sanctioned their use; and in confirmation, I may adduce the remark of Dr. Pearson, who justly observes, that no one medicine besides, (opium excepted,) derived from the animal, vegetable, or mineral kingdom, has maintained its credit with men actually employed in extensive practice, during a tenth part of that period. Although it is a medicine capable of being abused to the disappointment of the patient, and to the injury of the constitution, yet under the direction of cautious and judicious practitioners, it may be ranked as one of the most useful articles of the *Materia Medica*.

The chemical changes which have been proposed, in order to render mercury active and useful, may be reduced to oxidation in different degrees, and union with acids, constituting mercurial salts.



The Preparations of Mercury, may be considered under the three following heads;

1. As they are formed by trituration.
2. As they are combined with sulphur and Iodine.
3. As they are combined with acids of different kinds, forming salts.

The preparations by trituration, are formed by rubbing mercury with saccharine, mucilaginous, or other substances, until the globules of mercury are completely divided. By this operation, the mercury being exposed to the atmosphere, becomes oxidised.—They are more mild than the preparations formed by a combination with the acids, but to be effectual, the trituration should be complete, otherwise the practitioner will experience uncertainty in their use.

The first of the preparations under this head, is the *Pilulæ Hydrargyri*, or *Blue Pill*.

This is made by triturating quicksilver, with conserve of roses, or any mucilaginous matter, in a glass mortar, until the globules completely disappear. To effect its mechanical division, it is necessary that the quicksilver be rubbed down with some viscid substance, and a variety have been proposed, as soap, honey, extract of liquorice, manna and conserve of roses, the last is recommended by the London Dispensatory as being the least objectionable. When the mercury is extinguished, it is necessary to add starch or liquorice root powdered, in order to give the mass a proper consistency, and this is done when by rubbing a little of the mass on a piece of paper no globules appear. This is one of the best preparations of mercury, and may in general supercede most other forms of this medicine. In its preparation the mercury is minutely divided and converted into the black oxide.

The Blue Pill is manufactured by steam power, and is much superior to that made by the hand, being in a more minute and permanent division.

The black oxide of mercury. It is preferable to the blue pill prepared in the ordinary way by trituration, being more certain, efficient and regular. Half a grain is sufficient to be taken at bedtime; one-fourth of a grain is fully equal to four grains of the blue pill.  $\text{ʒi.}$  added to a pound of conserve of roses, immediately produces a substitute for the blue pill, with equal, if not superior medical virtues.

The blue pill is much employed to produce a mercurial impression in the system, sometimes to act as a laxative. For these purposes it is much less active than calomel, but possesses this advantage, that it may be administered to irritable subjects who are purged, or otherwise incommoded by the protochloride. It is the favorite formula of Mr. Abernethy, of London, and by him em-

ployed in the treatment of various affections of the stomach, and chylopoietic viscera. When intended to act as an alterative, it is given in doses of from four to six grains every other night, and in larger doses according to the intention to be answered.

One grain of mercury is contained in four grains of the Edinburgh mass; in three of the London, which is the formula preferred; and in two and a half of the Dublin. The form of pill being sometimes objectionable, the same preparation may be exhibited in a liquid form in what is called the

*Mistura Hydrargyri Mucilaginos.*

This is the second preparation formed by trituration, in which the mercury reduced to the state of a dark grey oxide, is combined with gum or vegetable mucilage. It was invented and introduced into practice, about forty years ago, by Professor Plenck, and therefore called Plenck's solution. It is made by rubbing mercury ℥ii., with mucilage of gum arabic ℥iii., and a sufficient quantity, ℥ss., of any syrup, in a marble mortar until the mercury has disappeared. To this was added ℥viii. of water, and the dose is about ℥i. morning and night. This is an inconvenient mode of exhibition, as the mercury does not remain sufficiently suspended. It is mostly used as a gargle in the venereal sore throat, as a collyrium in syphilitic ophthalmia, and as an injection in gonorrhœa. My experience with it is not considerable, but having used it in all the cases just mentioned, I have found its effects unequal. It is probably most advantageous in syphilitic sore throat, and even here a solution of corrosive sublimate would be equally successful. It is, however, a favorite remedy with many, and perhaps is worthy a fairer trial than I have been able to give it.

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*Unguentum Hydrargyri, or Mercurial Ointment.*—Of this ointment there are two preparations, the fortius and the mitius. The former is made by rubbing together two pounds of purified mercury, with an ounce of prepared suet, and a small quantity of twenty-three ounces of prepared lard, until the globules disappear, and then adding the remainder of the fat, and mixing. Two drachms of this ointment contain one drachm of mercury. The mitius is prepared by taking of the stronger ointment a pound, prepared lard two pounds, and mixing together.

The trituration should always be made first with the tallow, as the lard does not oppose sufficient resistance in facilitating the mercurial division. The ointment employed for mercurial friction is that prepared in the former manner.

The only use of the lard is to facilitate the extinction of the quicksilver, and the introduction of it through the cuticle, these purposes are perfectly attained from this proportion, and any larger quantity of unctuous matter merely weakens it, and renders it necessary to continue the friction longer.

The milder ointment is only used as an application to ulcers and some cutaneous affections. Mercurial ointment being a very tedious preparation and requiring both time and labour, is rarely found in the shops in the state that could be wished. This depends upon the difficulty, which is found to exist in minutely dividing the globules of mercury by the mere friction of lard and tallow. To facilitate this operation, various expedients have been proposed—but these, while they have effected the object desired, have impaired the value of the article. One of these was trituration of the mercury with Spirits of Turpentine before the fat was added, and this, by rapidly dividing the metal, and hastening its oxidation, caused much saving of labour. But while it had this good effect, it rendered the ointment too irritating for general use. It frequently produced when rubbed over any portion of the skin, either painful excoriations or an efflorescence which caused the ointment to be discontinued. The practice is still improperly pursued. Others have added a portion of Sulphur to the metal to facilitate its division.

By this the Cethiops Mineral or a Sulphuret of Mercury is formed, the ointment has a very dark appearance, and its activity is impaired. Others have recommended a small portion of rhubarb, and as this succeeds in effecting the division of the mercury without any ill consequences, its employment may very properly be practised. Rancid fat has been found to extinguish quicksilver better than recent fat, and may be allowed, as by the action of the metal the rancidity of the fat appears to be corrected. The addition of a little of the old ointment to the quicksilver, facilitates the operation considerably.

*Of the state in which Mercury exists in the Ointment.*—It was at one time supposed that the mercury derived its efficacy from its mechanical division. It is now, however, readily conceded that in this preparation the mercury is in a state of an oxid, combined with the lard, and that its beneficial effects are derived altogether from this oxid. It is also in the state of metal mechanically mixed, Its presence is not only useless but injurious, by obstructing the absorption of the active compound of the oxid.

By Murray it is considered that the quicksilver may suffer a further change. It is known that animal matters become rancid from the action of the air, and this rancidity appears to be connected with the formation of an acid, probably the acid produced by fat, the Sebacic, and this combined with the mercury forms a sebate of mercury. Having considered the formation of the mercurial ointment and the state in which mercury exists in its composition—I shall speak of its medical application.

Mecurial Ointment is the form under which mercury is introduced into the system by friction, and it has been considered as



the least exceptionable mode of impregnating the system. Mr. Hunter preferred this mode of administering mercury to the internal, because the skin is not nearly so essential to life as the stomach, and therefore capable in itself of bearing much more than the stomach. It becomes necessary to have recourse to it, in irritable habits, in which the preparations of mercury are likely to disagree with the bowels, producing griping and purging, or where, from particular circumstances, it is desirable to make a speedy impression upon the system. Under these circumstances its use will be found highly beneficial, and, I may say, indispensable.

It sometimes happens that the largest doses of mercury taken internally are inert, or fail in producing salivation. What the state of the stomach is, in these cases, it is difficult to say, but the ungent applied externally will often succeed after the failure of the internal mercurials.

Mercurial ointment is also employed in local affections, as tumors, buboes, &c. In order, however, that this mode of applying the mercury may produce the desired effect in the most expeditious manner, particular directions are to be enjoined upon the patient, and care to be observed in its proper performance. The patient should be directed to take a purgative a day or two before commencing the frictions—to use a warm bath of 96 or 98 of Fahrenheit, the skin is to be rubbed over with a flesh brush, or a piece of flannel and soap to cleanse it, and adapt it better for the purpose of absorption. The patient is then to rub in at night  $\mathfrak{z}$ i. to  $\mathfrak{z}$ iii. of the mercurial ointment, on the inside of the thigh or other parts, where the cuticle is thin and where the absorbents are numerous, the friction being continued until every particle of the ointment disappears. Before each new operation, the grease and blackness ought to be well cleansed or washed off, with soap and warm water, and the friction ought to be performed, if possible, by the patient. If, from circumstances, an assistant is required, his hand should be protected with a glove, or piece of bladder, otherwise there would be considerable risk of his being salivated. The degree of frequency that the frictions be repeated will depend upon the peculiarity of constitution, some being more readily affected than others, they must, however, be continued until the gums begin to swell or the breath to smell disagreeable, when they should be left off.

During the use of these measures, the patient (upon the authority of Swediaur and others) should avoid severe cold and damp weather, and especially the night air. The warm bath should be advised once or twice a week, as an adjuvant, during the continuance of the mercurial course. When an immediate effect is desired, the ointment is to be rubbed in the axilla and other parts of

the body, mercurial socks should be worn, or drawers of flannel lined with the ointment, or the use of mercurial sheets. But except in desperate cases, this free use of the mercury should not be resorted to, as it might bring on such a state of the system, which, if it did not kill, would render life miserable.

Dr. Chapman thinks that this practice may be resorted to in hydrocephalus, tetanus, and other diseases of a like fatal character. The only cases, he says, of the former disease being cured were submitted to this profuse mercurial practice. The late Dr. Wistar saved the life of one of his children by resorting to it.

The mercurial ointment has been highly recommended in erysipelas, by Dr. Dean, who first made its virtues known in this respect. He says, that in conjunction with depleting measures, the application of the ointment to the affected part, generally, in a short time, relieves the burning pain, heat, and itching of the inflammation. It has acquired the confidence of most practitioners who have employed it, and from the terms in which it is spoken of it is in every respect entitled to a trial.

It has long been a contested point how mercury operates when applied to the surface. By some it is supposed to be absorbed by the skin, but others assert that it is inhaled in the lungs and there produces its effects. Facts are adduced in support of each opinion. That it is absorbed by the skin and enters the circulation, is the opinion I should embrace after much reflection on this subject.

I have already observed to you that it was my decided impression, that the skin, in its natural and undisturbed state, was incapable of absorption. That when it did take place, it proceeded from the texture of the skin being in some degree deranged, whereby the substance to be introduced is forced under the squamous structure of the cuticle, and thus brought immediately into contact with the mouths of the absorbents. That there was but little doubt that mercurial ointment so applied was introduced into the system, and in this manner was carried into the circulation.

Medicines are not to be considered more foreign to the healthy fluids than several causes of diseases, if one be absorbed and circulate through the living vessels, the conclusion may be admitted relative to the other.

That certain medicines are absorbed and carried into the circulation, I have already mentioned—that mercurial medicines may likewise, we know from this practical fact, that infants labouring under syphilitic affections, are cured by administering mercurial preparations to their nurses. Thus, it would appear to have been absorbed, carried into the blood-vessels, and secreted with the milk by the arteries of the breast.

Mercury, says Mr. Cruikshank, lying upon the surface of the skin, or passing over the surfaces of the stomach and intestines without being absorbed, would never cure the venereal disease, nor do the venereal symptoms give way, till those of mercury, being in the system, begin to shew themselves.

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The last of the preparations of mercury, formed by trituration, which I shall mention, is the

*Hydrargyrum cum Creta.*—It is prepared by rubbing together mercury and prepared chalk until the globules disappear. This is a very mild preparation of mercury, and is employed in the same description of cases and peculiarities of constitution to which I have said the blue pill is adapted. It is, however, for its peculiarly good effects in the diseases of children, that I wish to bring it to your notice. It is particularly well adapted to the disordered condition of their first passages, which is of such frequent occurrence. The dejections exhibit in these cases a very considerable derangement of the secretions—being either of a greenish colour, or clay colored, or white—or, as regards consistence, thin and watery, or curdled, or slimy—and as regards odour, either highly offensive, or of an earthy smell. In many of these cases I have derived the greatest benefit from the mercurial preparations, and the present in particular. It has the happiest effect in correcting the deranged secretions, and after the bowels have been evacuated. I rely in many cases upon this article, aided by great attention to dieting—the quality of the mother's milk, and the diet of the mother to complete the cure. It is given in small doses, and often the beneficial effects which result are more permanent, than when larger doses are employed, at the same time they can be continued longer without apprehension of salivation. Three grains of the preparation contain one grain of mercury. So that half this quantity may be given for a dose, united with a larger proportion of prepared chalk, when we wish to avail ourselves of the antacid operation of the article.

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I shall now proceed to those preparations formed by a union with Sulphur. In combination with Sulphur we have two preparations.

1. *The Black Sulphuret of Mercury—Proto-Sulphuret of Mercury—Æthiops Mineral.*—This is prepared by rubbing together equal weights of purified mercury with sublimed sulphur, in a glass mortar with a glass pestle, until the globules of mercury altogether disappear.

This preparation is alterative, and anthelmintic, it is chiefly employed in scrofulous swellings, in cutaneous diseases, and has been found useful in ascarides. It is, however, the least active of the



mercurial medicines, mercury being far less active in mixture with sulphur, than with any other known species of matter, and is seldom employed in practice. The dose of it is from five grains to 3ss. given twice or three times a day.

II. *Bi-Sulphuret of Mercury, or the Red Sulphuret of Mercury, or Factitious Cinnabar*, in contradistinction to the native.—This is made by mixing together five parts of mercury with one of sulphur, the latter being in the state of fusion and the mixture is then sublimed—the two ingredients rise together without separation, and concrete in the upper part of the subliming jar, into a red mass called cinnabar or vermilion.

This preparation was once used in cutaneous and gouty affections, and combined with musk formed the famous Chinese remedy in hydrophobia. The dose is from x. to xx. grains.

There is no material difference between the native and factitious cinnabar, it is not much used internally, but it is a good deal employed in fumigations, to sores of a syphilitic taint or chronic ulcerations. Ulcers and excrescences about the pudenda and anus, are said to be particularly benefitted in this way, and in these cases the fumes are most conveniently applied by placing a piece of heated iron at the bottom of a night stool-pan, and sprinkling upon it a small portion of the red sulphuret, the patient being then placed upon the stool. On other occasions a shovel with lighted coals may be used, and with the assistance of a funnel, the fumes may be directed upon an ulcer situated in any particular part of the body. Ulcers in the fauces may be treated in the same manner, and will often yield to this treatment after various other means have been tried in vain. Contractions of the joints, from rheumatism, I have seen treated by fumigations with the happiest results, after frictions, the warm bath, salivation, and every variety of practice had been employed to no purpose.

While upon the subject of fumigations, it may not be improper to speak of them as a remedy in lues venerea, particularly when the experience of so distinguished an individual as Mr. Abernethy can be adduced. The practice of fumigations is one of the most ancient plans of affecting the constitution with mercury, and circumstances may be stated in its favour which certainly render it a very eligible mode. Were the peculiar advantages of mercurial fumigations generally known to practitioners, they would be much more frequently employed.

The advantages of this method consist in its affecting the constitution when other means have failed, and in producing effects in a much shorter time than any other mode requires. This practice is particularly desirable when venereal ulcerations are making great ravages in the palate, throat, &c., and when the system refuses to take on the mercurial action from the internal administra-

tion of mercury—or where patients have not strength to rub in the ointment, and whose bowels will not bear the internal exhibition of mercury.

Mr. Abernethy in his surgical work, when treating of diseases resembling syphilis, declares, that he has found mercurial fumigations, in the majority of instances, a more powerful and innocent means of producing a mercurial affection of the constitution, than inunction or the internal use of mercury, and equally certain of radically curing the disease for which it has been administered.

These remarks are accompanied with a case which illustrates his views very strongly, in which the patient was exposed to the fumes for half an hour every night, by which means, (though the case had been extremely tedious and resisted the mercurial action for a length of time,) in less than a fortnight, his constitution and mouth became properly affected—the ulcers healed soon afterwards, and in about a month he was permitted to discontinue the remedy.

The mode of applying the fumes of mercury, is in a bath similar to the sulphur bath, the patient being seated in it with an opening at the top, for the passage of the head, by which he breathes an air foreign to the bath. The vapour is admitted at the lower portion of the bath, and allowed to remain applied to the surface of the body from fifteen to twenty minutes. The powder used is one made by abstracting the chlorine from calomel by means of vol. alkali.

The practice was originally employed by the Chevalier Lallouette, a physician of Paris, in 1776, who also speaks in high terms of the beneficial effects produced by it.

A late writer in the Philadelphia Journal, Dr. Jackson, of Northumberland, proposes an extension of this practice, and recommends that it be employed in other cases of disease, which are violent and rapid in their course, in which mercurial remedies as ordinarily exhibited, cannot produce their impression upon the system, from the violent action which exists and the rapid progress of the disease. The diseases are such as have been, and are usually submitted to mercurial treatment:—yellow fever, bilious and malignant fevers generally, puerperal fever, typhus pneumonia. The plan proposed differs from that I have just detailed of enveloping the body in the fumes of mercury, and thus protecting the lungs from their action. It consists in inhaling through a tube, communicating with a small vessel, shaped like a cone, the vapour of mercury. This vessel has an opening at the side, into which a piece of heated iron is introduced, and ten grains of the protoxid of mercury thrown upon it. It is quickly volatilized, and the tube being taken into the mouth, the vapour is thus conveyed by inhalation into the lungs.

When the evaporation ceases, another such portion is thrown on the iron, and from two to six such portions may be used in immediate succession. This process may be repeated every two, four, six or eight hours, according to the exigencies of the case. The attendants, where this method has been used several days, have been salivated, and they must be cautioned against respiring the fumes more than is unavoidable.

This method of treatment is perfectly safe, and it has this great advantage, that the system can be placed under the mercurial influence in a very short space of time—in the space of twelve hours—and it must be a very intractable state of the body which can hold out more than two or three days. The extension of the fumigating practice, and that through the lungs, to the febrile conditions of the system, is, I believe, original with Mr. Jackson. It is a safe and practicable operation, and in diseases which are violent and rapid in their course—in diseases where the milder and less offensive modes of moderating or subduing morbid action have been unavailingly employed, or which cannot be persisted in longer from a failure of the vital powers—this plan of mercurializing the system presents no objection that I can conceive of.

It has been employed by Dr. J. in a dozen cases with the effect of speedily exciting ptyalism, and that never to any alarming extent—and in some cases of such malignant character that the tendencies to destruction could only have been arrested by this rapid and successful mode of administering mercury.

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The combinations of Mercury with Iodine, will be considered under the head of Iodine.

#### THE PREPARATIONS OF MERCURY BY ACIDS.

The third division of the Mercurial Preparations are those formed by acids. It should be observed that the preparations of mercury appear to act with more or less energy upon the system in proportion to the degree of oxidation. The acid compounds may therefore be considered the most energetic.

The first of these preparations is the *Hydrargyrus Nitratus Ruber*, *Red Precipitate*, or *Peroxide of Mercury*.

It is prepared by dissolving mercury in nitric acid, and exposing the nitrate formed, to a temperature just sufficient for expelling the whole of the nitric acid. It is commonly known by the name of the red precipitate.

This preparation is seldom used internally. It is not calculated to fulfil any indications, which cannot be obtained by the protoxide, and is liable to act violently upon the stomach and bowels, sometimes in doses of a grain only. Its exclusion, therefore, from internal use, is recommended.



Externally it is employed to cleanse ulcers, and to stimulate them to action. As an escharotic it is used to repress exuberant granulations, and with lard it forms an ointment for various purposes.

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With sulphuric acid is formed the *Sub-Sulphate of Mercury* or *Turpeth Mineral*.

It is prepared by pouring sulphuric acid upon half or equal its weight of quicksilver, and gradually heated until the liquor boils and the mass becomes dry, when it forms a white saline mass. On the affusion of warm water, the mass falls into powder, and immediately becomes yellow, a part of it saturated with acid, dissolving in the water. The yellow powder ground with fresh quantities of water, until all the soluble parts is extracted, becomes insipid, and in this state, called the sub-sulphate of mercury, proves, though not corrosive, strongly emetic—operating in this respect the most effectually of all the mercurials that can be given with safety.

It is too harsh for general use, and is seldom employed. Its action is not confined to the primæ viæ, but is very apt to produce salivation, if a cathartic is not employed soon after.

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*Sub Murias Hydrargyri et Ammonia*.—The ammoniated sub-muriate of mercury. This article is only used externally in the form of ointment, in the proportion of  $\text{ʒi.}$  of the salt to  $\text{ʒi.}$  of the lard, for obstinate eruptions, herpetic affections, scabies, &c.

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The combinations of mercury with chlorine, are the most valuable and efficacious remedies the *Materia Medica* affords. They form the per and proto-chlorides of mercury.

The *Per-Chloride of Mercury*, is formed by subliming a mixture of the bi-sulphate of the peroxide of mercury, with the chloride of sodium—the per-chloride of mercury being formed during the process.

This is the most corrosive, and the most acrid preparation of mercury with which we are acquainted. It was first introduced into practice by the celebrated Van Swieten, and by him recommended in the form of alcoholic solution. Soon after it engaged the attention of all Europe. By some it was recommended as a very efficacious and excellent remedy for the most inveterate complaints and worst stages of syphilis, and it was particularly extolled for eruptions of the skin, and syphilitic affections of the bones. Whilst others exclaimed against it as being frequently productive of the worst effects in the system, without hardly ever radically curing the disease.

There still exists some opposition of opinion, as to the anti-

syphilitic powers of this medicine, or rather the stage in which it should be employed.

Mr. Pearson whose opinions are entitled to great weight on this subject, says, that the result of his observations is, that simple calomel or calcined mercury are preparations more to be depended upon for the cure of the primary symptoms than corrosive sublimate. The latter will often check the progress of the secondary symptoms very conveniently, and he thinks is peculiarly efficacious in relieving venereal pains, in healing ulcers of the throat, and promoting desquamation of the eruptions. Yet even in these cases, it never confers permanent benefit, as new symptoms will appear during its use, and on many occasions it will fail to afford the least advantage to the patients from first to last.

If ever he employs this preparation in venereal cases it is either at the beginning of a mercurial course to bring the constitution under the influence of mercury at an early period, or during a course of inunction, with the intention of increasing the action of simple mercury. He sometimes employs it after the conclusion of a course of frictions, to support the mercurial influence in the habit, in order to guard against the danger of a relapse. But on no occasion whatever does he think it safe to confide in this preparation singly and uncombined, for the cure of any true venereal symptom.

Opposed to the authority of Mr. Pearson is the experience of many physicians of Europe and this country.

We have already mentioned Van Swieten, and among other distinguished names are those of Locher, DeHaen, Pringle, Cleg-horn, &c.

The testimony of Dr. Locher, of the Vienna Hospital, is full and explicit on this subject. Having witnessed the severe effects arising from salivation, and other abuses which existed in that institution, in the management of venereal patients, upon the recommendation of Van Swieten, he made trial of the Corrosive Sublimate.

From the year 1754 to '62, he cured by it no less than 4880 persons, without inducing salivation, and testifies that no person died, or experienced the least painful and dangerous symptoms in consequence of this remedy.

In the cases in which the same preparation was recommended by Sir J. Pringle, the cures that were effected were permanent, and the report of the physicians is equally favourable.

In this country the efficacy of the Corrosive Sublimate has been fully tested, and perhaps more particularly by Dr. Hosack, of New-York. From this gentleman's experience, he is fully convinced of the anti-venereal properties of this medicine, and that in a degree equal, if not superior to the other mercurial preparations.

The severe effects which have been attributed to its use by Swediaur and others, as cardialgia, griping, purging, head-ache, fever, oppression at the chest, &c. he has never observed, and he believes that there are few articles which can be more readily be accommodated to the peculiar condition of the patient, and the nature and stage of the disease. Where unpleasant symptoms occur, they are rather to be attributed to some peculiarity of constitution obnoxious to mercurial remedies, or to the improper preparation of the corrosive sublimate, or to its having been given in undue quantity. As a proof of its comparative mildness it may be stated, that when given to children, or even infants, labouring under some hereditary taint, obstinate cutaneous disease, or other symptoms requiring an alterative course, it has never produced pernicious effects.

It has been used very extensively in the New-York Hospital, both in the primary and secondary stages of the lues venerea, and hardly a case, it is stated, is recollected in which the cure has not been permanent.—*Francis' Dissertation.*

If these reports are correct, the medicine claims our attention, as it has this advantage over the other mercurial preparations, that it seldom or ever salivates.

My own opinion, founded upon some experience, is, that the blue pill, or calomel, are by far the best remedies for the venereal in its first stages, but that after these have passed off and the secondary have commenced, the corrosive sublimate, aided by decoctions of sarsaparilla, or combined with the syrup of sarsaparilla as already mentioned, will be found better than any other preparation.

It may be given in the form of pill or dissolved in spirits, the latter mode is I think preferable, as the dose can be more accurately measured. The following is the formula :

℞. Corrosive Sublimate, g. iv.

Alcohol, ℥i.—m.

For a child one year old, gtt. iv.

For a child two years old, gtt. viii.

For an adult gtt. xxv. which is equivalent to the 1-4 of a grain. To be repeated three or four times a day.

Or it may be made into pills in the following manner :

℞. Per-chloride of Mercury,

Muriate of Ammonia, a g. xv.

Distilled water, ℥iss.

To this is added as much of the crust of bread as will make it into a mass, and divided into 120 pills. Each pill contains 1-8 of a grain of mercury. The muriate of ammonia is added, because by it the corrosive sublimate is rendered more soluble in water.

The per-chloride is employed in other diseases with advantage,



as in ulcers which have existed a long time, in various cutaneous affections and in rheumatism.

In various chronic affections, especially chronic inflammations, it is a very valuable article combined with the vegetable alteratives, particularly sarsaparilla, and in these cases is given in very minute doses, 1-3 to 1-2 of a grain in a pint of a decoction daily. It is to be continued as long as it is thought necessary, taking care to watch its effects upon the mouth, and always keeping in view, that mercury given in excess, will tend to increase, rather than destroy constitutional irritation.

The per-chloride of mercury dissolved in a tincture of cinchona, in the proportion ij. grs. to an ounce, and given in doses of x. or xv. drops, according to the age of the patient, twice a day, will be found a valuable medicine in the chronic diseases of children, and with particular good effects, in those cases where there is enlargements of the mesenteric glands.

Many of the empirical remedies, which are boasted of as curing syphilis without mercury, owe their efficacy to this substance. The dose being small, it is easily disguised with other articles with which it is mixed, and it is less liable than the other preparations of mercury to excite ptyalism.

The dose of this substance is from the 1-8 to 1-4 of a grain.

Externally it is employed for various purposes.

In combination with lime-water, it forms the yellow-wash, so much recommended by Mr. Carmichael in the treatment of obstinate and ill-conditioned ulcers, and in very small quantities of 1-2 of a grain to an ounce, it forms an excellent injection in the advanced stages of gonorrhœa and gleet.

*Of the poisonous action of the Corrosive Sublimate.*—The Corrosive Sublimate administered internally in a very small dose as the 1-8 of a grain, produces a temporary excitement of the alimentary canal, of the organs concerned in the circulation, and in several of the secretions. The local phenomena are not very evident if we except a sense of heat in the stomach.

If the dose is a little stronger, and especially if its use has been too long continued it gives rise to colic and vomiting. The salivary glands inflame and become very painful. The functions of the stomach are often very much impaired—Cardialgia—Dyspepsia—Diarrhœa—Dysentery—various inflammations. To these are added violent pains in the muscles, tendons and joints, tremors of the limbs, paralysis, and death may possibly be the result of the improper use of this article, that is of being given in too large doses, or too long continued.

When given in a dose still larger, as x. or xx. grains, it acts as a violent poison, attended with the most distressing symptoms. They are as follows—an acrid, astringent, metallic taste in the

mouth—a sense of stricture and burning heat in the throat—anxiety and rending pains in the stomach and the whole of the intestinal canal—nausea—frequent vomiting of a fluid which is sometimes bloody, and accompanied with violent efforts—diarrhæa—sometimes dysentery—pulse small and frequent—fainting—general debility—difficulty of breathing—cold sweats—general insensibility—convulsions, and death.

The manner in which the poison produces its effects, according to the experiments of Mr. Brodie, depends in the first place upon the corrosive action exerted by it upon the stomach, and secondly upon the extension of that action to the heart and brain, and that death is the result of the suspension of the functions of these two organs so essentially necessary to life. That these organs are affected, is inferred from the convulsions—the general insensibility—the state of the pulse, and the sudden cessation of the action of the heart.

The treatment to be pursued, if called to a person who has taken, by accident or design, a large dose of the per-chloride. Various alkaline earths and salts, were formerly in much repute as antidotes against this salt, and cases are to be found in medical journals where they would seem to have cured the sufferers.—They have also failed, and the same remark will apply to the sulphurets, the infusion of Peruvian bark, and sugar.

We are therefore infinitely indebted to Orfila for introducing albumen as an antidote to this substance. If taken in a sufficient quantity it decomposes the salt, forming a triple compound, consisting of albumen, muriatic acid and calomel. Its efficacy has been proved in several experiments on animals.

The first step therefore to be taken is to administer to the patient several glasses of the white of eggs beat up with water, and he should be made to swallow as much as the stomach can contain. It requires, according to Dr. Perchier, of Geneva, an ounce of the white of eggs to neutralise four grains of corrosive sublimate, taken as a poison.

Several cases are related in the journals of the successful employment of this substance—among them I may mention that it was the means of saving the life of M. Thenard, the Chemist. While at lecture, this gentleman inadvertently swallowed, instead of water, a mouthful of a concentrated solution of corrosive sublimate. Immediately perceiving the error, he sent for the white of eggs, which he was fortunate enough to procure in five minutes. Although at this time he had not vomited, he suffered no material harm. Without the prompt use of the albumen, he would almost infallibly have perished.

Along with the use of this article, blood-letting should be had recourse to, if the organs of the abdomen are in a state of inflam-

mation, for it is not uncommon to find gastritis, enteritis, and even peritonitis, as the consequences of this accident. Local bleeding by leeches should also be employed—emollient anodyne glysters should be added, and fomentations to the abdomen.

An Italian physician has recommended wheat flour or gluten as an antidote.

On the morbid effects of medicines, consult Orfila, Beck's Medical Jurisprudence, or Christison on Poisons.

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The next of the combinations of chlorine is the *Proto-chloride*. It is prepared by combining with the corrosive sublimate fresh quicksilver. One atom of mercury is mixed with one atom of corrosive sublimate and triturated until the globules disappear, a little water being added to prevent the acrid powder from rising. The mixture is then to be sublimed in a glass matrass or Florence flask. After each sublimation it is reduced to powder, and well washed with distilled water, in order to separate any portions of corrosive sublimate which may be formed. Corrosive sublimate being soluble in water, and calomel insoluble, this is a ready mode of separating them. The washing is continued until the water poured off no longer affords any precipitate, on a few drops of the water of carbonate of potash being added to it.

Preparations of mercury analogous to this, were distinguished according to the number of sublimations they had undergone.

After three sublimations it was *mercurius dulcis*—after six *calomelas*—after eight *panacea mercurialis*—but from subsequent experiments it is ascertained that the preparation is not improved by these repeated sublimations—a small portion of the per-chloride being formed after each, so that no advantage, but rather the contrary must arise from an increased number.

This is the most important and most extensively employed article in the whole range of the *Materia Medica*. It is capable of fulfilling more indications, and of being applied advantageously to a greater variety of diseases, than any other article which is furnished by the vegetable or mineral kingdoms.

It is antisyphilitic, antispasmodic, alterative, deobstruent, purgative, errhine, sialagogue, anthelmintic.

As a remedy for syphilis, it may be employed with advantage and success, provided it is not allowed to pass off by the bowels.

As an antispasmodic it may be employed in convulsive diseases, as epilepsy, tetanus, &c.

As an alterative and deobstruent, it is employed with advantage in cutaneous affections, as lepra, scabies, and in hepatitis and glandular obstructions.

In dropsies it assists the action of squills, and as a purgative it may be employed with safety in almost every form of disease.



As an anthelmintic I have already spoken of it, and as a sialagogue in the diseases of yellow fever, and other febrile affections its powers are often truly great.

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*General operation of Calomel on the system.*—Mercury when rendered active by chemical changes, as in a state of oxid or neutral salt, seems to be stimulus to every part of the system. When taken into the system it manifests itself by a quickened circulation, gives the blood the disposition to take on the buffy coat when drawn, renders the pulse frequent and harder, increases respiration, excites the temperature of the body, occasions a whitish fur on the tongue, and other symptoms of general inflammatory action.—*Francis.*

Besides these effects it seems to be a stimulus to all the excretories of the body, of the salivary glands, of the trachea, lungs, digestive organs, the chylopoietic viscera, and the whole alimentary canal. It proves often diuretic, and Dr. Cullen says that he has met with particular proofs of its reaching and acting upon the organs of perspiration.

In its thus extensive influence on the body, it produces consequently an increased action of the absorbent vessels.

It is slow in its operation, but when accumulated in the system to a sufficient degree, its action is exhibited in the production of such excitement, as to be called morbus mercurialis, during which the functional operations of all the systems of the body, are quickened and excited to a very great degree.

It is these various and diversified powers, which give to mercury its very great superiority, and as particular effects are produced by regulating the dose, it becomes a remedy very generally applicable to diseases.

The good effects of mercury in fevers depend

1. On its power of evacuating bile, fæces, and the morbid secretions of the alimentary canal. It is well known that in malignant fevers, the intestines are loaded, not only with increased quantity, but a vitiated quality of all the secretions which are poured into them. These, by retention, are not only increased in the degree of their morbid qualities, but by their accumulation become, in reality, exciting causes of disease. They have been known to possess such a degree of acrimony, as to excoriate the rectum, and the skin of the neighboring parts. For the removal of these acrimonious matters, the milder cathartics, as the neutral salts, &c. have been resorted to, for fear of increasing the debility which exists. Calomel alone, though generally in combination, surpasses all other cathartics, not only in evacuating the contents of the bowels, but by exciting the several glands which empty into them, to a free and copious discharge. changing the charac-

ter of their vitiated secretions, relieving topical congestions, and by removing the causes which indirectly debilitate, the patient is strengthened.

2. The good effects of mercury in the cure of fevers, depend upon its exciting a new action in the vessels, or one different from that which constitutes the proximate cause of the disease, and accordingly, we find, that as the mercurial action begins to exhibit itself, the symptoms of the original disease subside. This action commences with the approach of salivation, which seems to be the test of the mercurial impression. The fact of the original disease giving way, upon the approach of the mercurial, is so well established, that it hardly seems necessary to adduce proofs. For your satisfaction, I might detail the opinions of the most distinguished advocates of the mercurial practice on this point, of Drs. Rush, Chisolm, Clark, Warren, and others.

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Such being the *modus operandi* of mercury in fevers, its importance in the acute diseases of our country may well be conceived, and first of its use in Yellow Fever. Here it has experienced the fate which attends conspicuous stations, that of having advocates and detractors. By some it is considered the only article upon which confidence should be placed, while by others it has been thought useless and dangerous. In an extensive practice, it will doubtless be found, that the employment of so active an article will be productive of untoward symptoms, and candour would compel the admission, that many cases perhaps would have recovered upon an alterative purging course of treatment. Still, it must be admitted, that in a disease so violent and destructive in its progress, where such extensive derangements exist, and where, from the want of proper attention, relapses are very liable to occur, the mercurial practice carried to the point of salivation, might be found upon the whole the most safe to pursue. The evidence in favor of salivation is supported by so many and such distinguished individuals, that we cannot in consistency reject their statements.

In addition to the authorities I have mentioned, upon the good effects of salivation, Dr. Warren declares, that in the yellow fever of Boston, the calomel practice, which was usually prescribed after bleeding, and a purge, in doses of two or three grains every two hours until the mouth became sore, was invariably followed by a decline of the disease.

The mercurial practice which was pursued by many of the physicians of our city in the year 1819 and subsequently, was distinguished with the like success, and wherever it could be made to produce its sialogogue effect, its great influence was always acknowledged.

The practice of Dr. Chisolm, in the yellow fever of the West Indies, a disease very nearly allied to our own, is so much in point, and the method of administering the proto-chloride, with its effects and the progress of the complaint, so analogous to that experienced in the same disease, in the southern section of our country, that I cannot resist its insertion.

My mode of using calomel says Dr. C. is to give ten grains to an adult patient as soon as possible after I see him. This generally acts as an aperient in the degree required, about an hour after it is given. At the end of three hours more the same quantity is given, adding opium or not, as the preceding doses have acted. In this manner ten grains are given every three hours, till the salivary glands become affected, which generally happens in less than twenty-four hours from the commencement of the treatment. The effect of the medicine given in this manner may be perceived after the third dose in general, the patient becoming calmer, less restless, less anxious, his skin becoming softer and possessed of an agreeable heat, the stomach being perfectly retentive, however irritable it might have been before, and the eyes recovering their former lustre and sensibility. When at length salivation takes place the patient is left free from disease, with a moderate warm moisture on his skin, and very soon signs of returning health are indicated by calls for food. The recovery of strength is proportionably rapid, nor is it at all necessary to have recourse to bark, or any other medicine whatsoever, a circumstance truly gratifying, both to the physician and patient, in a disease wherein nature revolts at the very idea of it. In fact calomel is the only medicine, except the occasional addition of opium, I have lately given—of course the practice has been as simple as efficacious, an additional encouragement to the practitioner, and to those whose situation may render them liable to receive the pestilential infection.—*Chisolm on Malignant Fevers.*

Such was the practice pursued, with some variations, according to circumstances, in the yellow fever of our city, and though condemned by some, and subject to objections by all, will nevertheless be found to have been the practice adopted by the majority.

I might detail to you the practice of other physicians in the West India Islands. Of Dr. Clarke, in the Island of Trinidad, who observes, with respect to the fever which prevailed there in 1793, that when there was time for salivating, mercury was always successful. In St. Lucia, where the yellow remittent fever prevailed in 1769, more than any other of the Islands, calomel was given in doses of eight or ten grains every three hours, and when the mouth was affected, which was expedited by the cold bath, an amendment was observed. The mortality under this practice was one in seven.



Enough has been said to convince you of the importance of this article in yellow fever. In thus bringing before you the views I have taken of the operation of calomel, and the practice of different individuals, I would not wish to be understood that the mercurial is the only practice which is to be pursued. I am, on the contrary, most favorable to the employment of general and local blood letting in this fever, the use of the cold affusion, purgative and diaphoretic medicines, with blisters, and the benefits to be derived from a rigid system of abstinence, when that peculiarly irritable and inflammatory condition of the stomach takes place, which precedes and accompanies the black vomit. With these means I have combatted this severe disease, and my practice, I have had reason to think, was as successful as most of my medical brethren.

In severe cases it was observed, that the high excitement of the system, resisted the mercurial action, and though employed in large doses, and repeated at proper intervals, yet it failed to produce its specific effects, and death was often the consequence. In other cases where this excitement was less violent, the peculiar effects of the mercury were produced, and with ptyalism a gradual subsidence of all the symptoms took place. In these cases, I have every reason to think, that equally beneficial effects follow from the practice mentioned—and on some accounts it was preferable, as patients in their convalescence were not distressed with the disagreeable effects of sore mouth, swelled tongue, &c.

It is indeed true, as Bright and Addison observe, that when the mercurial action can be fully established in fever, the disease pretty uniformly proves of short duration, and thence forth free from danger. But as it is at all times extremely difficult and even impossible to affect the system with mercury in bad cases of fever, the fact just stated probably rather argues that the mildness of the particular case permitted the usual operation of the remedy, rather than, that the remedy controlled the fever.

Whatever my views might be, I conceive that in treating of a disease which has called forth so much talent and research in its investigation, the treatment I should enforce as a teacher should side in with the opinions and practice of men so much distinguished, and where so many were allied in support of a particular practice, the presumption might be that truth was on their side.

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Of the utility of mercury in the Bilious Remittent of our climate. This disease in many of its characters presents considerable analogy to the bilious remittents of other hot countries. It originates in effluvia exhaled from the surface of marshes and swamps, varying in the degree of severity according to heat, rain and other circumstances of the season. The effect of

its operation is the production of fever characterized by many symptoms of violence and with a particular determination to the hepatic system. The parts of the system most frequently affected, are the stomach, the head and the præcordia, and it is the severity with which they are affected that marks the character of the fever. Other symptoms doubtless exist, but it is to these principally that the attention will be directed. Under the term præcordia is included the state of the liver, spleen, &c. and it is the condition of the former organ that gives a hue and complexion to the whole complaint. It will be found in these cases inflamed, its secretions deranged, and its vessels often engorged with blood. It is here that calomel exhibits its best effects. Commencing its operation higher in the alimentary canal than most purgatives, and exerting its action peculiarly upon the liver, it is well calculated to afford relief to the suffering condition of this organ, and indirectly to the other systems of the body. By its purgative operation, the acrid and irritating contents of the bowels are dislodged upon the first approach of the disease, and their accumulation prevented during its continuance. Calomel exercises another beneficial effect in these cases. Being tasteless and of a small bulk, it may be employed, and retained upon the stomach, when other cathartics, from the irritability of that organ would be rejected.

These are some of the advantages following the use of this medicine, but it exerts others; by exciting a new action upon the hepatic system, the morbid affection is suspended, and consequently the cause which produces a super-abundant secretion is removed. By exciting a new action, it is known to produce increased secretion in some torpid affections of the liver when it is deficient, and in the same way it appears to diminish them where they are already too great, thus exercising a sort of equalizing or balancing influence over its secretions. To produce this effect, it is necessary that its use be continued for two or more days until its sialogogue operation is manifested, which is only the symptom that the salivary and the other glands of the system are affected. When this takes place, the concurrent testimony of most writers fully corroborates the opinion I have already expressed, of the speedy subsidence of all untoward symptoms, and the establishment of convalescence. To select a few of the many authorities upon this subject, I shall refer you to Johnson's work on the influence of tropical climates on European constitutions. In our city the practice has a number of supporters, and its beneficial effects are fully acknowledged.

The advantages arising from this course are, that relapses were less frequent after the mercurial practice than where the purga-

tive and diaphoretic plan was pursued, and the opinion is confirmed by the physicians of our city.

Exercising, as this medicine does, an influence so powerful, and in the several modes I have pointed out, I still think, that in the very acute diseases of our country, it is not alone sufficient. In this disease as well as yellow fever, blood-letting at the commencement, is of the utmost importance in diminishing action, lessening undue determinations, reducing inflammation, and other effects, of which I have already spoken. Neither can we depend upon calomel as a cathartic, for in these acute cases its operation is too slow, and the sufferings of the patient require that prompt measures be enforced. It is proper, therefore, to alternate its use with the saline cathartics, and this course continued until the disease begins to decline, or the mercurial preparations to exhibit their effects upon the system, either in improved secretions or if still further continued, in its impression upon the gums and salivary glands. To these must be added the use of the cold and tepid baths, as already described.

I could state to you particular instances of the different effects of a mercurial, and a purgative and diaphoretic practice. The consequence of the latter treatment has been, that though the fever was subdued, yet the convalescence was tardy, the system continued irritable, with occasional chills and heats, and upon the slightest irregularity in diet, or exposure, these symptoms became heightened and a relapse was the consequence. The same practice being again pursued, the fever may again be checked, but the system is left in the same susceptible state.

From these attacks occurring frequently, the constitution is worn out and exhausted, and in this situation change of climate is thought necessary to alter morbid action, and renew the vital energy.

This condition of the constitution is intimately connected with the derangements of the biliary system which require something specific to control. Calomel is the medicine required, and carried to the extent of producing an alterative action, the secretions of the liver are changed, and the effects above described are not experienced. I repeat it therefore, that from the mercurial practice in these fevers relapses less frequently occur, and that this is one of the great advantages conferred by this medicine. While I thus advocate the use of this article, I cannot too earnestly caution you in the administration of it.

Salivation is always painful and very distressing to your patients, and moreover is not necessary in the degree to which it is carried. All that is required, is a gentle mercurial impression to the extent of producing a little tumefaction of the gums, and a slight spitting. This is what most practitioners will allow, is all that is to be desired. Yet, from a careless employment of the



medicine, the sialagogue operation often takes place, to a great, and even alarming degree. It is, therefore, important, that you should be informed how it may be obviated, and by attention to a few rules, you will, in most cases, succeed.

I. In those cases in which mercury is employed, with a view to produce ptyalism, examine the evacuations of your patients, and as the secretions of the liver begin to change, that is from being thin, offensive, and of a bad colour, to a more healthy aspect, characterized by the appearance of healthy bile, by a smell less offensive, and greater consistence, immediately to discontinue the mercurial, or lessen the dose, or lengthen the periods at which it is given. You must not shrink from a duty, in which the welfare of your patient is concerned, and by which you are to judge of the successful operation of your medicines. The evacuations, therefore, in all severe cases of fever should be examined, as well to determine the degree of morbid action, going on in the system, as to direct your prescriptions.

II. When you suspect that the mercurial action is commencing, examine at every visit the state of the gums; as soon as they appear a little inflamed, with a slight separation from the teeth, discontinue the medicine, and upon no account be induced to give a single dose or a grain, after this appearance shews itself. Some evacuating medicine should be employed to remove from the bowels whatever may not be taken up. When the state of the gums is improved, small doses may be resorted to, to keep up the action in the system.

III. By attending to the constitution of the patient. The sialagogue operation of mercury is very badly borne by persons of delicate habits, in whom the nervous temperament chiefly prevails. It is badly borne by persons advanced in life, whose constitutions have been impaired by previous attacks of sickness, and who are, therefore, weak and enfeebled.

IV. The sialagogue operation of mercury should not be attempted in persons under twelve years of age. By attending to these rules, severe cases of salivation will be prevented from occurring, I will not say invariably, but in a great majority of cases. Only observe the same precautions with this medicine that is done with other active articles. We discontinue the use of opium when sleep is induced—digitalis when it affects the head and vision—arsenic when it swells the body, and calomel when it *changes the secretions*. This is the most difficult to be discovered, but attention is so much the more necessary, as it is difficult, and as its effects are more lasting, and I may say more distressing.

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In Intermittents, mercury, in ordinary cases, is not required; in the form of a purgative, it is employed preparatory to the

administration of the bark. In protracted cases, however, it is necessary. It becomes useful when from the long continuance of the disease, obstructions and induration exist in the viscera. Dr. Cleghorn examined the bodies of near one hundred persons who died with this fever, and constantly found the omentum, mesentery, colon, &c., of a deep black complexion, the gall bladder full and turgid, and the stomach and intestines overflowed with bilious matter, the spleen enlarged, weighing four or five pounds, and extremely soft and pliable. Though it does not fully appear that the liver is the principal sufferer in this fever, yet the local affections which have been commonly considered the proper object of a mercurial practice became so fully established as to render the article necessary.

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In Typhus Fever. Of late years mercury has been much extolled in this species of fever. The Typhus to which I allude is not the Typhous Pneumonia, which has prevailed at different times, in various parts of the United States, but the typhus gravior and mitior of Cullen, which sometimes exist. In the commencement of this disease, the plan pursued by Dr. Hamilton, has been the administration of mercurial purges, which relieves the intestines of black and viscid matter, with an abatement of the symptoms. In the declining stages of the disease, when but little fever exists, attended with great debility, black tongue, &c., and when the system demands the active employment of large quantities of bark, wine, &c., without any material benefit, mercury employed in small doses, in combination with opium, every two or three hours, not to purge, but to stimulate the arterial system, and bring on a mercurial fever, has often been found very beneficial. In proof of this we have the opinion and example of Dr. Rush and other physicians of Philadelphia. Dr. Rush, in typhus mitior, found, on salivation taking place, the pulse becoming full and slow, with evident relief. The petechial eruptions which occur in typhus, are supposed to be owing to a loss of tone in the venous system, and the stimulant power of mercury may be considered well adapted to the purpose of restoring it. Other writers have spoken highly of this remedy in typhus, but particularly in that variety which is called the congestive form of the disease.

I shall appeal to experience for the beneficial effects of the practice recommended.

I have been informed by a very worthy graduate of our school, Dr. Hardy, of Ashville, N. C., a gentleman of much good sense and observation, that his success in the treatment of typhus fever by mercurials, was very decided and gratifying. Of twenty-three cases, which occurred in the western parts of Buncombe

County, N. C., he did not loose a single patient where mercury had been employed, and the only two cases lost of this number, were subjected to other than mercurial treatment.

In the Phlegmasiæ, mercury has been recommended, but more particularly in the affections of the glandular system, the liver, &c. In all the acute attacks of hepatitis, the disease is more beneficially treated by V. S., mercurial purges, and other remedies. This practice has the following advantages, that by it is lessened the inflammatory action of the liver and the portal circle, and the tone of the constitution is lowered, which we know accelerates the operation of mercurial medicines. When the disease becomes chronic, no other mode of treatment than the mercurial can with safety be resorted to. The secretion of healthy bile says Johnson, the flow of saliva from the mouth, and a gentle and uniform perspiration on the skin, were synchronous effects of the medicine, and certain indications of the approaching cure. But it is necessary to keep up these effects by small doses of the medicine, not only till every symptom of the disease had diminished, but till the clear countenance, keen appetite, and regularity of bowels had returned, and health and strength were completely restored.

It is sometimes necessary to introduce the medicine in large doses, in order to arrest the progress of this disease towards suppuration, but in ordinary cases it is most proper to introduce it gradually into the system. In the hepatitis of the East Indies, inflammation runs through its several stages with great rapidity, and calomel must be resorted to early and vigorously. The doses under such circumstances, Johnson advises, should not be less than 20 grains, three times a day, until ptyalism is produced, and in such quantities it will be found to sit easier on the stomach and occasion less irritation in the bowels, than smaller doses. Such practice is, however, rarely required in the hepatitis of our climate, but the importance of the medicine, is not less in our diseases of this organ, than in those of India.

The manner in which mercury operates beneficially in the diseases of the hepatic system may readily be understood. If absorbent glands are enlarged, the mercurial diathesis frequently makes them suppurate. The same therefore, would also in many cases excite suppuration of the liver, when this was diseased as of other structures; but the determination to this gland, produced by mercury, instead of exciting suppuration, forces it upon an active secretion, by which its state of congestion is relieved, as congestion or determination is in other instances, by a spontaneous or other ending in secretion. The mercurial practice must be considered as applying to the disorder, before the structure of the liver is destroyed.—*Pring's Pathology.*



In the diseases of which I have spoken the efficacy of calomel may be considered fully substantiated, but there are many others which I shall mention, of an Inflammatory nature, in which the good effects of this medicine are so apparent as to have received the title of anti-inflammatory.

To Dr. Hamilton, of Lynn Regis, the credit of applying calomel to these cases is justly due. His first communication on the subject may be found in the Medical Commentaries, Vol. IX. The opinion of the anti-inflammatory properties of calomel is supported by its efficacy in the cure of ophthalmia, its efficacy in every symptomatic venereal inflammation, its success over the hepatitis of India, and in the experience of its utility in other inflammatory affections. From its utility in these diseases his conclusion was, that as mercury had been so successful an agent in the several instances above mentioned, it was reasonable, from analogy, to suppose, that it would be equally so in every kind of inflammatory disease. It has, therefore, been applied to a variety of others, as pneumonia, rheumatism, &c. with the happiest effects. The theory of its operation in these cases is ingeniously built upon the known property of mercury in equalizing the circulation and communicating a power to the capillary system of vessels, which enables them to resume their secretory offices as before. This is the theory of Dr. Armstrong, and who that considers carefully the known operation of mercury, will be disposed to acknowledge its correctness. Disease, in many instances is often kept up by a disordered action of the extreme vessels, and a medicine which has its action mainly directed upon these, must be considered an important agent in restoring the healthy operations of the system.

The practice pursued by Dr. Hamilton, in inflammatory diseases, was the following—blood was taken away in the beginning of the disease, in the quantity proportioned to the violence of the inflammatory symptoms, and to the age and constitution of the patient. The bowels were next ordered to be opened, either by a clyster, or more commonly by a gentle purgative. After which a combination, consisting of from one to five grains of calomel and from a quarter to one grain of opium, was administered every six, eight or twelve hours, according to the age and strength of the patient, and to the degree of inflammation. The patient was generally very much relieved after having taken three or four doses of this medicine in the course of twenty-four hours, and the distemper commonly gave way in twenty-four hours more, and soon terminated afterwards. But if relief was not obtained within the first twenty-four hours, and the high inflammatory symptoms remained with little or no abatement, the bleeding was repeated, and the mercurial composition was not

only repeated more frequently, but continued until the disease terminated by sweating, purging, or ptyalism. If this curative mode was adopted early, the patients recovery was soon accomplished, whatever might be the operation of the mercury, whether it acted upon the skin, bowels or salivary glands. If the fever or inflammatory action was very high, accompanied with a dry contracted, arid skin, emetic tartar, and sometimes camphor, was added. Dr. Hamilton states, that he never found any medicine, either in a single or aggregate state, produce so speedy and effectual a relaxation of the skin and plentiful perspiration, as a composition of calomel, opium, emetic tartar and camphor, which also has the advantage of increasing the evacuations by stool. These views of the operation of calomel are invaluable, or, in the more emphatic language of Dr. Armstrong, deserve to be engraven in letters of gold, on account of their great practical application and utility. I should gladly enter more in detail of these views, but I fear I shall be encroaching on the province of another, and will refer you to the original paper of Armstrong on Typhus. Having pointed out the principle upon which mercury operates in inflammatory affections, I shall treat cursorily of the several diseases in which it has been employed.

In Irritable ulcers, the combination of calomel and opium, in the opinion of Sir A. Cooper, is the very best on which you can rely, in the proportion of one and a half grains of calomel and one grain of opium, morning and evening. Nothing, he states, will be of so much service as this medicine. It should not be carried so far as to produce ptyalism, or to affect the constitution severely, but it should be given to restore the secretions and to diminish the action of the nervous system. The calomel will do the first and the opium will allay nervous irritability.

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In Cynanche Trachealis, Calomel has been recommended by the Scotch physicians in the highest terms. Mr. James Anderson, of Edinburg, some years since communicated to Dr. Duncan a number of cases in which calomel had been useful, and in subsequent trials was confirmed in his opinion, that it ought to be considered an efficacious medicine in cynanche trachealis. Dr. Rush also says that our principal dependance must be placed upon this medicine. A large dose of it should be given as soon as the disease discovers itself, and smaller doses should be administered every day while any of its symptoms continue. With the views I have presented you of this disease, I should treat it actively in the commencement, until inflammatory symptoms are checked, afterwards no medicine would be more effectual than calomel in doses frequently repeated, calculating that beneficial effects would arise from its equalizing the circulation and restoring to the capillaries their accustomed powers of secretion.

In Pneumonia, mercury has been recommended. The treatment should be the same;—active depletion at first, and mercury combined to subdue the remaining excitement.

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Of the effects of mercury in Phthisis Pulmonalis, we have many contradictory accounts. The reports of Dr. Rush, of the efficacy of this treatment, gave rise with some to sanguine expectations that a remedy was at length discovered for this medical opprobrium. Mercury has been tried to the extent of producing salivation, and it has been known to suspend all the symptoms of tubercular phthisis, the patient not coughing during the ptyalism. But although the symptoms may be suspended, they recur as the mercurial affection abates, and the patient dies after a long course of the disease. In short, I never knew of recovery from phthisis by mercury, or any other means, where the tubercular form of this disease was characterized. On the other hand, I have known cases of ulceration following acute inflammation of the lungs, which have become chronic, and continued many weeks, with quick pulse, colliquative sweats, pain on inspiration, buffed blood, and purulent expectoration, which have recovered perfectly after salivation. Where there is not, as in tubercular phthisis, a mechanical cause of irritation, or where the local disease of the lungs is that merely of ulceration, which is indisposed to heal, I believe that the change of action produced by mercury may excite a disposition, subverting at the same time the febrile tendency. Mere ulceration of the lungs is not necessarily a fatal symptom. It is not uncommon for persons to recover, who have received a wound by a small sword in the lungs, or by a bullet which has gone quite through one lung and perhaps has been cut out from the back.

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Bronchitis, after refusing to yield to all the artillery of the antiphlogistic plan of treatment, and after continuing a period which threatened to end in consumption, has had all the symptoms attending upon it, yield to small doses of calomel and James' powder, repeated several times a day. The mercurial commonly quickened the pulse a little before the gums were affected, but after a slight ptyalism was produced, the pulse commonly subsided, the patients lost their other symptoms, and were regularly convalescent from that period.

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In Rheumatism, after action has been sufficiently reduced, diaphoretics, I have mentioned, become useful. Their utility is much increased by the addition of calomel, and, as far as I may judge, from experience, the combination of this article with opium and ipecacuanha, will be found well adapted to these cases. Dr.



Hamilton speaks of the efficacy of calomel in combination with opium in acute rheumatism, and adds that he has had the satisfaction of seeing this disease give way most readily to it. Dr. Clark, in his account of the diseases of long voyages, observes, that he successfully treated rheumatic complaints, after they had resisted the usual remedies, with mercurial pills and frictions, taking care to avoid salivation, which he observed to be injurious, by protracting the disease. The concurrent testimony of most writers is in favor of a mercurial practice in this disease, and of urging it to the point of salivation, after other means have failed. Some cases, in short, will not yield to any thing until the mouth is affected by mercury. Others recover during the use of the remedy, but relapse as soon as the ptyalism ceases;—here a repetition of the mercurial course is not proper.

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In the Intestinal Affections, mercury is used with advantage. In Dysentery, the value of this article has been ascertained beyond all doubt. In the milder forms of the disease, the common methods of treatment will doubtless succeed very well, as V. S., purgatives, anodynes, &c. But in the more violent attacks, such as occasionally appear in our climate, and more particularly in the East and West Indies, calomel is the only medicine which can with safety be relied on. It should be given freely and frequently, and while it has the effect of restoring healthy perspiration and the biliary secretion, it gently evacuates the bowels of irritating and feculent matters, with great relief to all the distressing symptoms. To be effectual it must be given in large doses, as ten, fifteen, or twenty grains, every three or four hours, until ptyalism is produced, when, as is asserted, upon the testimony of all writers on this subject, the uneasiness subsides. The work of Dr. Johnson, on Tropical Climates, should be consulted by all on this subject.

Upon the same principle that it operates in this disease, it is equally effectual in obstinate constipation of the bowels, in colica pictonum. In this latter affection, Dr. Clark declares, that it rarely fails to open the bowels when given largely.

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In Dyspepsia mercury is a very valuable article. The principle to be kept in view, in the treatment of some forms of this disease, is, that in addition to means which give vigor to the alimentary canal, we should employ those which correct the morbid state of the liver. Mercury is a remedy capable of effecting these objects, and its use should be discontinued when the appearance of the alvine evacuations indicate the return of a healthy secretion. With its improvement, Wilson Philip observes, the skin generally becomes relaxed and of a proper tem-

perature, the pulse more dilated, the colour and expression of the countenance better, and in particular, that expression of langour, so peculiar to the advanced stages of the disease, abates.

In Cholera Morbus mercury exhibits equally valuable effects. Its employment fulfils many valuable purposes, it allays the inordinate gastric irritability, lessens the too abundant secretion of bile, and by equalizing the circulation relieves the congestion of the vessels which form the vena portæ. It is upon the irregular state of the circulating fluids and particularly that of the portal system, that many of the effects observed in this disease are to be attributed. Mercury, from the peculiarity of its operation, tends to relieve them all. The efficacy of the mercurial practice has been long tested by the late Dr. Miller, of New-York; and in a recent publication by Dr. Ayre, on Marasmus, the same practice is recommended. In this disease, from the great irritability of the stomach and upper portion of the intestinal canal, few evacuating medicines if required, could, from their bulk be retained. They would only add to the general distress. Calomel is therefore particularly useful in this situation—it is inodorous, insipid, and is comprised in a small compass. It is therefore highly probable that it will remain upon the stomach, and if a sufficient number of doses are given, it will remove the offending matters of the primæ viæ. It moreover, as I have observed, exercises an equalizing operation upon the secretions of the hepatic system—excites them when deficient, and lessens them when in excess. It is well calculated to contend with this complaint, and I have known a single dose, or a couple, to relieve all the urgent symptoms, after oil and laudanum, enemata, cathartic and anodyne, fomentations, and a variety of other means had been employed to no purpose. The practice which I pursue is to administer five or ten grains in a pill or powder, combined with one grain of opium, or alone, according to the degree of irritability, every two hours, until the disease subsides. Other means are to be employed, which will be pointed out by the Professor of the practice. I must claim your attention to one other form of disease, in which the efficacy of this article is strongly exhibited—I mean the

Intestinal Derangements of Children, comprehended under the term gripes, looseness of the bowels, &c. These affections are most common in the first twelve or eighteen months of their existence, and are often extremely troublesome, and, what is more to be lamented, very fatal. The passages are frequently of a green colour, curdled, attended with pain, great restlessness, and generally fever. Where circumstances require, I direct the bowels to be evacuated, and soon after the following preparation,

R. Calomel, grs. iii.

Cretæ, ppt. grs. xii.—m. and divide into vi. powders, one to be taken every night and morning in a little syrup. Under the use of this medicine the symptoms soon subside, the color of the passages is altered, and an amendment soon follows. In some instances, I have commenced with the use of these powders without any previous preparation, and have often been pleased with the result. The good effects which are experienced I have considered dependant upon the change which is produced in the secretions of the liver and primæ viæ, since the improvement has taken place without any sensible operation being observed. If there is any practice to which I could wish more particularly to direct your attention, it is the utility of this combination in these diseases.

I have frequently administered it, and can unhesitatingly say, that I have derived more benefit from it than from any other single agent I have employed. In speaking of this and other remedies, you must not conceive that any article is sufficient in itself to effect cures. They are means which are often only useful in conjunction with such other aids as are to be derived from diet, clothing, the preparation of the patient, the stage of the disease, and other circumstances, of which you must judge. It must not be continued too long for fear of producing ptyalism.

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In Tetanus relief has commonly been expected from the employment of opium given to a very large extent. Much experience has convinced me of the entire inefficiency of this plan of treatment, and the necessity we are under of looking to other means for the subjugation of this distressing affection. Of those to which I would next resort, mercury promises to be most powerful. As the progress of the disease is rapid, I would employ it in doses of five grains every two hours, until an impression was made upon the mouth, employing at the same time mercurial frictions. Dr. Rush cured a case of this disease by salivation, aided with bark and wine. The German physicians speak highly of the same practice, and my friend Dr. Dickson has succeeded by the use of the same means.

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In Dropsies the utility of mercury is well known. Combined with various diuretics, it promotes their operation, and increases the activity of the absorbents. Where the disease is connected with visceral obstructions, the employment of this article is attended with the happiest effects.

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It would be easy for me to dilate upon the application of mercury to the cure of diseases, as there is scarce one in which it has not been used, and the beneficial effects of which, at one stage or



the other have not been acknowledged. The greatest difficulty I have experienced, has been to condense the matter which is to be found, relative to its application, in order to illustrate its mode of action. There is, however, one other disease, in which its very great importance should not be overlooked, viz. its use in Syphilitic Affections.

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It is already well known that mercury is the grand remedy for all complaints unequivocally venereal. This is so much the case, that this medicine is usually regarded as a specific, and the only one to be depended upon for a cure.

The origin of the venereal disease, has been a subject of much debate among most medical writers. By the greater part of them we are informed that it was brought by Columbus and his companions from the West Indies, between the years 1494 and 1496. The proofs, however, in favor of this origin are all equivocal, and we shall find much difficulty, in ascertaining the precise period of its appearance, as well as the causes which gave rise to it. In whatever manner it arose, says Mr. Hunter, it certainly began in the human race, as we know no other animal that is capable of being infected with this poison. It is probable too, he says, that the parts of generation were the first affected, for if it had taken place in any other part of the body, it might probably never have gone further than the person in whom it first arose.

When the disease first made its appearance in Europe, its malignity was so great, that the consternation produced by it may be more easily conceived than described. The manner in which the disease was communicated, the rapidity with which it passed from one order of disgusting symptoms to another, and above all the want of knowledge of the remedies which were proper to arrest its progress, furnished reasons sufficiently strong for regarding it as one of the most destructive scourges that had been inflicted on mankind. We can form no idea of the disease at that period from its present appearance. There can be no doubt at present, of a change of character in the syphilitic disease, and that its symptoms are milder and more tractable. Astruc observes, nearly one hundred years ago, that the disease is less violent, its symptoms not so many, so painful, or so difficult to be cured—it yields more readily to remedies properly applied, he says, and seems by little and little to approach towards a close. On its first appearance in Europe, of a hundred persons infected, there were no fewer than ten deaths. If such was its character at its first appearance, the importance of a remedy calculated to arrest its progress, may well be conceived. In the medical history of mercury, I have given an account of the manner in which this article came to be employed in the treatment of syphilis,

and stated to you, that it is to the Arabian physicians we are indebted for its application to the purposes of medicine. Rhazes, we are told, recommended an ointment, in which quicksilver was an ingredient, for the cure of cutaneous diseases, and the practice we may suppose soon became common, to apply it to such complaints having a syphilitic origin. From its external employment, it began to be ventured upon internally, and about the year 1535 we find this mode of exhibition beginning to be practised. It is not necessary to employ time with an account of the variety of preparations which were in vogue, nor of the empirical and barbarous practice which was pursued, but will at once pass over this period to the eighteenth century, when this disease began to be treated on scientific principles. The doctrines of Mr Hunter have had a greater effect in producing revolutions in the theories formed, concerning the nature and treatment of this disorder, than any that preceded him, and even at this time have a very great effect in regulating the practice upon this subject. Having had such extensive influence, it may not be amiss to state the leading opinions entertained by him on the subject of the venereal. He considers

1st. That the venereal poison, being taken into the system, becomes universally diffused, and contaminates such parts as are susceptible of the venereal action, and that it is soon after expelled the system, along with some of the excretions.

2d. That the parts contaminated do not immediately go into venereal action, but that they acquire a new state or condition, which is termed a disposition to take on the venereal action.

3d. That the number of parts contaminated does not depend on the quantity or strength of the virus absorbed.

4th. That the disposition once formed in a part, necessarily goes on to action at some future period.

5th. That mercury can cure the venereal action, but cannot remove the disposition which has been previously formed, and has not yet come into action.

6th. That although mercury does not destroy the disposition already formed, yet that it prevents it from forming.

7th. That though the disposition continues, it does not go into action during the use of mercury.

8th. That the action having once taken place, goes on increasing without wearing itself out.

9th. That parts once cured, never become contaminated again, from the same stock of infection.

10th. That the matter of the secondary ulcer is not infectious.

11th. That the venereal matter is as soon destroyed in a large chancre as in a small one, the mercury acting equally on every part of the sore.

Such is a summary of the views of Mr. Hunter on this subject. Some of his positions are not clear in their expression, and are ambiguous in their meaning, particularly that which relates to the disposition of parts to take on the venereal action. It is not my intention to enter upon a defence of Mr. Hunter, but to bring before you the treatment he recommended, and which has had a number of advocates.

In the treatment of this disease, mercury, he says, is to be employed both externally and internally, and in every case, let it be ever so slight, and even where the disease has been destroyed on its first appearance. It must be employed during the whole time of the cure, and continued for some time after the chancres have healed. The quantity should be such as will produce a slight affection of the mouth, and as soon as this is affected it must be discontinued, or only given in such moderate doses as will keep up the sialagogue operation for ten or twelve days. The extent to which ptyalism has been carried, is preposterous in the highest degree, as no good effect can be derived from it, but on the contrary, the system sustains much injury. A slight salivation is sufficient in most cases, and it is most effectual when produced by small quantities of mercury, gradually introduced, than when the condition of the system is suddenly changed by a large quantity. For this purpose small doses of calomel, or, what is preferable, the blue pill with mercurial frictions, are to be repeated until the constitution becomes affected slightly, and this is to be continued for a week or ten days, when the local disease will be found to have healed. If the remedies have been applied before the venereal matter has been absorbed into the system, the disease will terminate with the healing of the mouth. But if matter has been absorbed, other parts of the body may acquire a disposition, as Mr. Hunter calls it, to diseased action, as the skin, the throat, or the bones, and the disease will severally appear in them, and in the order in which they succeed. This is the part of Mr. H's. doctrine which has been the subject of much controversy. My limits do not allow me to enter into its discussion, sufficient for me to state that when the disease does appear in any of these parts, mercury, in the view of Mr. Hunter, is the proper remedy.

Of the *modus operandi* of mercury in curing Syphilis. Upon this subject there are as many different theories formed as there are writers on the disease. The most conspicuous are Girtanner, Beddoes, Thornton, &c., but these I shall pass over, and merely consider the opinions of Hunter and Bell on this subject. Mr. Hunter in speaking of the nature of the venereal matter, regards it as a poison, which irritating the living parts, in a manner peculiar to itself, produces an inflammation peculiar to that irritation, and from which a matter is produced peculiar to the inflammation.



The good effects of mercury therefore depend upon its exciting an action incompatible with that which existed, counteracting the venereal irritation by producing another of a different kind. Upon the principle that no two morbid actions can exist at the same time in the constitution, is erected his views of the curative operation of mercury in syphilis. The theory here advanced, though not strictly tenable is probably the most plausible that has been delivered.\* Because we know that mercury is an universal stimulus, causing great irritability of the constitution, making the heart to beat faster, and rendering the arteries more rigid so as to produce a hard pulse. We also know that it produces a disease, or a peculiar or unnatural mode of action, changing the action of the extreme vessels, particularly the secretory vessels of the body, and it is to this double operation that its good effects may be attributed.

The theory of Mr. Bell is less tenable. It proceeds upon the supposition that mercury being carried into the constitution combines with, and neutralizes the matter of the disease. This opinion is supported, upon the experiment of the matter of lues venerea being mixed with triturated mercury, becoming inert, and incapable of producing disease upon inoculation. The assumption of such an operation in the human system is altogether gratuitous, and the venereal matter becoming inert, can be admitted only as a species of chemical agency, upon inorganised materials, and will by no means apply to the organized animate body. If the operation of mercury depended upon this principle, the successful treatment of the disease would depend upon the quantity of the medicine employed. This is at variance with the opinion of most practical men on the subject. The operation of corrosive sublimate would seem to depend upon a very different principle.—*Francis.*

Such is a concise account of the venereal disease, and of the manner in which it has been treated for the last century, and by many still at the present time. It becomes my duty, however, to state, that within the last few years, the propriety of employing mercury to the extent which has been done, in diseases of the genitals, has been questioned; it being asserted that many affections having a near resemblance both to the primary and secondary symptoms of syphilis, have been cured without the use of mercury. The subject has excited the attention of several distinguished surgeons, and the result has been a conviction, that the

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\*That two morbid actions can take place at the same time in the constitution, is supported by the occurrence of small-pox and measles in the same individual, of whooping-cough during the eruptive stage of small pox, of small-pox combined with scarlatina, vaccination and measles.

genital organs are subject to ulcerations arising either from want of cleanliness, or from the acrid secretions of the parts. That these ulcerations bear a very close resemblance to syphilis, but may, in the generality of cases, be distinguished from it, the pathognomonic characters having been pointed out by Carmichael, Abernethy, and others, to which I would refer you. Though a similitude exists in some cases to a great degree, there are generally some marks by which they may be distinguished. They have not the character of the syphilitic ulcer described by Mr. Hunter, but are less retorted at their edges, more shallow, more rapid in their progress, and pour out more abundantly an acrid discharge. Mercury internally seems to aggravate them, and the ulcers readily heal by the use of astringent washes and a purgative course. The practice, therefore, which has been recommended in cases which have not the decided Hunterian character, is to give up the use of mercury in the primary ulcers, treating them as if they were simple ulcerations, by cleanliness, rest, abstinence, and simple applications. But if they remain open beyond a reasonable length of time, mercury should certainly be used. The same principles are to be observed in the case of buboes and cutaneous eruptions.

The efficacy of this practice has been confirmed in my attendance at the Marine Hospital of this city.

In very few cases was mercury employed, and then with a very sparing hand. The result has been very gratifying, inasmuch as the patients were restored in a comparatively short space of time, without those distressing effects which frequently follow the use of this article, or those tedious and painful complications which arise from other diseases being developed by the mercurial irritation.

1st. Ulcerations of the penis have been treated as simple ulcers by mild evacuants from the bowels, the use of astringent washes, the lunar caustic, simple dressings, a moderate and spare diet. By this course, with an occasional variation of the remedies, the local injuries of the genital organs have been healed in the course of a few weeks. When they exhibit an indolence in their action, or continue open longer than is thought prudent or safe, they are then excited by the use of mercurials externally employed, and occasionally internally exhibited.

2d. Buboes in their different stages, have been speedily reduced by the same means. In their inflammatory state, and even after suppuration had commenced, they have yielded to blood-letting, evacuants, repeated at regular intervals every other day or twice a week, rest and a recumbent posture, the use of cold applications, or blisters, and a regulated diet. The most severe cases were relieved in five or six weeks.

3d. Where buboes have ulcerated before admission, or a day or two after admission, the same course was pursued and with effects equally gratifying.

Throughout, these diseases, which have so long been considered as arising from a specific virus, were treated as inflammatory affections of a simple character, and in no instance was failure or disappointment experienced.

When improvement does not follow this course, after it has been pursued a sufficient length of time, then the mercurials were properly resorted to.

In secondary affections, a non-mercurial course, or a very sparing use of mercury was pursued. In only one case admitted during my attendance, the internal employment of mercury created much distress from the general irritability of the system, and particularly the digestive system. Opiates were necessary with the use of the vegetable alteratives, and the external employment of mercurials as a dressing to the ulcers, until an action was manifested on the gums. Under this cautious use of mercury, combined with the vegetable alteratives, a healing action was established, and ulcers which would have been extremely tedious and obstinate under another course, speedily cicatrized.

Secondary symptoms, from this non-mercurial practice, were not seen, or they did not occur before the patients were discharged. It should be noticed further, that these symptoms follow in pseudosyphilitic cases, as in true syphilis. They are said to occur more frequently and appear at an earlier and more determinate period, than where mercury has been used, but they, in many cases, have gone off as soon. Never, as has been supposed, proceeding from bad to worse, or from one succession of parts to another in unabated violence, on the contrary, they do not exhibit the same violent and unrelenting symptoms which we have observed when mercury has been used.—*Hennen on Syphilis.*

Such seems to be the practice which our present knowledge of the disease authorizes, and prudence sanctions, and it is the practice of several English Army Surgeons, as well as Mr. Carmichael, and Mr. Abernethy. It was observed, as I have mentioned, by Astruc 100 years ago, that the venereal disease was milder then, than upon its first introduction—the same remark may be made respecting the present appearance of the disease, and what it was at the time of Astruc.

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*Morbid effects produced from the use of Mercury.*—It has been satisfactorily ascertained that when mercury is introduced into the system in too large quantities, or in particular idiosyncrasies of constitution, that it is liable to excite a disease of a distinct and



specific character. This disease is variously denominated by writers, as the *Erethismus Mercuriale*—the *Eczema Mercuriale* and *Hydrargyrium*, all, however, having allusion to the same affection. The disease consists in an eruption upon the skin, varying in appearance from a light rose colour to a dark red tint, and even to a purple, accompanied with considerable heat and itching, with fever, head-ache, and symptoms of gastric derangement. The eruption commences about the scrotum, the inside of the thighs, groins and lower part of the abdomen, and spreads over the body. Desquamation generally commences on the fourth day after the appearance of the eruption, leaving the skin of a red colour, which gradually acquires a more natural appearance with each successive exfoliation, until desquamation ceases altogether. The varieties in the disease, founded upon its mildness or severity, are three—1st. *Hydrargyria mitis vel sine febre*—2d. *Hydrargyria simplex febrilis*—3d. *Hydrargyria Maligna*. That this troublesome disease is produced by the use of mercury, is evident from the following circumstances, viz. that mercury aggravates the symptoms of the complaint—that it will cease upon its being discontinued, and that it may be re-produced by a too early or incautious recurrence to the medicine. The causes of it must be referred to such as are constitutional, i. e. depending upon a particular idiosyncrasy, or such as are local or accidental. That it depends upon idiosyncrasy is proved by its being produced in two sisters at the same time, in the Locke Hospital of Dublin, and whose cases discovered symptoms of peculiar malignity.

A peculiarity of habit sometimes exists, in which mercury acts as a poison, and almost immediately tends to the production of this disease, even when given in the smallest quantity. A certain state of the skin, Mr. Alley considers, also favorable to the disease. When these pre-disposing causes exist, it is not necessary that very large doses of mercury be given to excite it into action, a small quantity, and that of the mildest preparations, has been known to produce it. As soon as the disease appears, all mercurial remedies should be discontinued, for it is remarkable, that as soon as mercury begins to excite in the constitution its peculiar morbid operation, its anti-venereal powers cease, and it has no influence over the complaint until the constitution becomes entirely relieved from its mercurial effects. In the treatment of this disease, the first step to be taken towards a cure, is to discontinue the use of mercurial medicines—to remove the patient from the apartment in which they have been exhibited, and to advise tepid bathing and some gentle purgative. For further particulars, in the treatment in the disease, I shall refer you to the work of Mr. Alley on *Hydrargyrium*, Mr. Pearson's observations, &c. It is with pleasure, however, that I can inform you that it is of rare occurrence.

Another of the morbid effects of Mercury is Salivation. This, is often a most unpleasant consequence of the employment of mercurial preparations, and sometimes, by its violence, a more distressing disease than the original complaint. Salivation, though not necessary to the curative operations of mercury, is, in the opinion of most practitioners, a desirable effect of the mercurial practice. Those very profuse salivations, which were at one time thought so essential for the full attainment of its beneficial action, are now happily abandoned, and physicians in all cases would be satisfied with only a moderate sialagogue operation. This, however, cannot always be obtained, as from the peculiarities of constitution, the nature of the disease, or other causes which cannot be foreknown, severe effects follow the administration of mercury in some cases, when in others none are produced. The only mode of preventing them, is to exercise great caution, and to watch the progress of symptoms; observing at the same time the rules already mentioned.

When the disease is formed in a great degree, the treatment will be directed in the first place to the mitigation of pain. This is effected by washing the mouth with a solution of opium, either in water or milk; or a very strong infusion of green tea; or a solution of the acetate of lead, to which is added a portion of laudanum. This, however, Dr. Chapman observes, is objectionable, on account of its effects upon the teeth and mouth, rendering them black. This condition of these parts is readily removed by washing them with a tooth-brush, and the relief afforded by the gargle is very considerable. Chloride of soda in solution is a very valuable article.

Emetics have lately been considered useful in counteracting the morbid effects of mercury. The practice originated in observing the operation of a small dose of opium, ipecuacuanha and sac. saturni, produced in a patient labouring under a profuse hæmorrhage from the bowels, brought on by the inordinate action of calomel. The patient was at the time labouring under a most profuse salivation, amounting even to sloughing of the mouth and fauces. In consequence of the great irritability of the stomach, the effect of the above dose was violent vomiting, when it was observed that while the hæmorrhage was suppressed, the mercurial affection was quickly arrested. The attention being drawn to this circumstance, emetics were tried in other cases of profuse salivation, which had resisted the usual practice, and they were not less beneficial than in the first instance. The practice originated with Dr. Field, of Virginia, and being tried by other medical gentlemen of that state, their conclusion was, that the utility of emetics, in arresting salivation and the progress of gangrene, was entitled to be considered a very important medical improvement.

The second object to be pursued is to determine the fluids to other parts. Cathartics are among the means calculated to fulfil this indication. Sulphur, upon the principle of its rendering mercury inert out of the body, has been much recommended, but it possesses little action in subduing the effects of a mercurial course, otherwise than from its cathartic operation. Any mild medicine may be employed with this view, except the saline preparations, which have been supposed calculated to quicken the mercurial action. Blisters, upon the principle of counter irritants, have also been recommended, either to the swellings, or to the back of the neck. To these we may add leeches, ice water, cooling applications, &c. When much sloughing exists with a fetid breath, the pyroligneous acid diluted, may be employed with advantage. A late writer in the Philadelphia Journal recommends a gargle made of the root of the rhus glabrum, as being mucilaginous, soothing, allaying pain and irritation. The variety of means which have been proposed, shews that nothing is actually known, which can exclusively be depended upon.

The third object to be pursued, is to heal the local injury by restoring the tone of the parts. This is done by astringent gargles, composed of red rose leaves, red oak bark, galls with a small portion of alum and honey.

Mr. Bell recommends a strong solution of borax, as possessed of peculiar virtues in answering this intention. By pursuing the precautions I have mentioned, and a proper treatment during ptyalism, the strong objections which have been made against the general introduction of mercury into practice, from a supposition of its injuring the teeth and constitution, will be obviated. The too careless manner in which the remedy has been administered, has but too often served to foster the prejudices which have been entertained of its use. While, therefore, in your practice it will be found an agent of the highest value, and the changes which it produces in the system, such as no other article can imitate, use it also as a two-edged sword, which, if incautiously employed, will wound you in your reputation, as well as the hopes of your patients by retarding their recovery, or otherwise affecting their system.

REFERENCE.—*Francis' Inaugural Dissertation.*



## DIVISION X.

## EXPECTORANTS.

*Medicines which promote the secretion of the Bronchial passages.*

THE organs communicating with the external air are lined with a membrane of a thin and delicate structure, which pours out a mucous secretion. This fluid constantly lubricates the whole of its surface. It is limpid, mild, and nearly insipid, or rather saltish, and of little tenacity in the natural state. It is produced in so small a quantity in a state of health, that it seems to be dissolved by the air, and thus to pass off insensibly in expiration, or to be taken up by the absorbents. Under various circumstances it is poured out much more abundantly, and is altered in color and consistence; it is then expelled by the expiratory efforts which constitute cough. In its natural state the membrane is white, and but few marks of vessels can be seen upon it, but in disease vessels are developed, and become perceptible, particularly in catarrhal affections, to which this membrane is very subject. The blood is then accumulated in the capillaries, and gives to the membrane a red colour. The increased secretion which takes place is one of the terminations of inflammation by resolution, being a species of depletion which the vessels undergo, and the good effects of which are familiarly illustrated in the discharges from the nostrils, which follow inflammation of the Schneiderian membrane. To promote this discharge from the lungs and trachea, is the object of this class of medicines. There is frequent occasion for such remedies, since the lungs and trachea are frequently irritated by mucous, which is either distressing from its quantity, or by its density and tenacity. It is not surprising then, that physicians in search of such remedies, administered many medicines with this intention. But it is not agreed whether any medicines possess a specific power of promoting the secretion or expectoration from the lungs. The principal object in attempting to facilitate the discharge of the contents of the bronchial vessels and cells, must consist in changing the nature of those contents, so as to render them thinner, less tenacious, and more moveable than before. Whether we are possessed of any medicines capable of producing such a direct effect may admit of a question. The generality of writers on the *Materia Medica*, and of physicians, speak of the utility of such medicines as they have termed *Attenuantia* for this purpose, but we may believe with Dr. Cullen that their hypothesis on this subject is altogether erroneous, and that no such medicines exist. The only probable explanation of the action of an expectorant medicine appears to

be, that by increasing the secretion from the exhalent arteries in the lungs, the mucous may be diluted and rendered less viscid, and the passages from the cells may be more fully moistened with a less tenacious fluid. We know that there is a constant and considerable exhalation of moisture from the lungs; and there are many reasons for believing that this is an excrementitious secretion, connected with the other excrementitious secretion, particularly with the perspiration from the surface of the body. If, therefore, there are medicines disposed to pass by perspiration it may be presumed that the same are disposed to pass by the exhalents of the lungs; and this exhalation may not only be increased, but the mucous produced by the follicles, may also be poured out in a less viscid form, and consequently in a state to be more easily brought up by expectoration. Such is the most reasonable explanation of the action of this class of remedies. In its application much latitude is allowed, and a variety of articles of diversified characters are employed, according to the different states of the lungs, and the circumstances which promote an increase of their secretions, or their discharge. Where much inflammation of the membrane of the trachea and lungs exists, denoted by a dry and irritable cough, sense of fulness of the chest, dyspnæa, all of which denote an increased determination of fluids to this part,—depleting remedies by reducing action, and allowing secretion to take place, gives relief to many of these symptoms. This state of the lining membrane is familiarly illustrated in a similar affection of the membrane of the nostrils producing what is commonly called a cold in the head. Here the membrane is thickened by inflammation and the passage of air through the nostrils impeded. The uneasy feelings thus produced are allayed, and speedily carried off by the discharge which takes place.

Expectoration is promoted by medicines which produce an action upon the stomach. This would seem to depend upon the production of nausea, exciting as it does an increase of the cutaneous secretions, and in like manner an increase of the thinner secretion of the lungs. For nausea by means of that singular consent between the stomach and many other parts, may either relax the spasm of the very minute secretory, and exhaling vessels of the lungs, or excite them to more vigorous action, when the mucous becomes at once more copious and healthy, and its expectoration more easy. The same effect is produced more completely by the operation of an emetic, which agitating the passage of air through the bronchia and its ramifications, expels much mucous which is collected in many diseases, and affords often great relief to the system.

Expectoration is promoted by various stimulating substances,

which, by irritating the fauces and upper part of the larynx, and the system generally, excite the muscles of the thorax and diaphragm, to convulsive contractions, which expelling the air of the lungs with some rapidity through the windpipe, mucous collected in it is discharged. Expectorants of this nature are best adapted to the chronic coughs of old people, when to the accumulation existing there is a deficiency of muscular power to effect its expulsion.

Under the class of expectorants is included various mild, gummy and mucilaginous substances—such as spermaceti, gum arabic, flaxseed, liquorice, tragacanth, &c. This class is most useful when the mucous is too thin and acrid, and when there is a frequent and almost dry cough, with great irritation of the lungs and branches of the bronchia. They are therefore more properly demulcents, but since they allay irritation, and thereby allow the mucous to be collected and then expectorated, they may be comprehended under this division. There has been some dispute about the action of these substances—some suppose that they produce their good effects by being received into the blood and conveyed to the lungs, while others suppose that it is only during deglutition, by lubricating the fauces and glottis, and by this means defending them from irritation, that relief follows their use. This at least is certain, that many of them so suddenly allay the cough, and remove the irritation, previously very troublesome, that it is utterly impossible that they could have reached the affected parts by the blood. But the cough being allayed, and the agitation of the lungs consequent upon it being for a while composed, the mucous, which was present in the lungs and trachea, is allowed to collect and becomes inspissated, and the strength of the patient being in the meantime somewhat restored, it is easily and copiously ejected with the first cough which occurs. Nothing more remarkably points out the connection of various parts of the system than the preceding circumstance; that an impression of a soothing nature being made upon the fauces and glottis should be sufficient for a time to allay irritation of the pulmonary system, and lessen coughing. The fact is such, and in the cases to which allusion was made, the benefit afforded by these substances is very considerable.

There are yet other means of exciting expectoration. Blisters applied to the breast, side or back, not unfrequently manifestly promote expectoration. Their operation seems to consist in lessening inflammation, relaxing spasm, and promoting a more equal distribution of the fluids.

The steam of warm water inhaled into the lungs, by promoting the exhalation and secretion of mucous, which it also dilutes and attenuates, renders the expectoration more easy and prompt, and on many occasions answers valuable purposes.



## PARTICULAR EXPECTORANTS.

In particularizing the articles of this class, I shall follow the order pursued in considering their general operation.

Upon depleting remedies I need not enlarge further, as from what has been said when upon the subject, their operation is understood, and their great efficacy in restoring secretions which have been suspended.

Of those whose action is upon the stomach, and which operate by increasing the pulmonary secretions.

*Ipecacuanha*.—The natural and chemical history of this article having been fully treated of, and its application to diseases, I shall only observe that in small or nauseating doses, it is often of considerable benefit as an expectorant. For this purpose it is employed in catarrhal and pulmonic disorders, and in different states of these complaints, it appears to exert a decided action in promoting expectoration, particularly where the mucous membrane is dry and inflamed. It is seldom employed alone, since more is gained by the co-operation of these remedies, than can be obtained by the exhibition of any of them separately.

The remarks which have been made upon this article, may be applied with equal propriety to the Tartarized Antimony, given either in the form of powder or vinous solution.

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*Scilla Maritima*.—To the properties of this article which have been enumerated must be added its expectorant. It is possessed of these in a considerable degree, and is perhaps more frequently resorted to, than any other of this class. In the diseases of children connected with accumulation of mucous in the bronchial passages, and in their catarrhal affections, few articles are more deserving of attention, since to its action in stimulating the mucous follicles, and exciting more copious excretion from the lungs, by a small augmentation of its dose, emesis speedily follows, and with it the expulsion of the viscid matter which had oppressed the pulmonary system. In asthmatic affections, dyspnœa, arising from similar causes, it is much employed, and is held in general estimation. In short in all pulmonic affections, after action has been reduced, it is found to be a very valuable medicine. It is rendered more useful when combined with the nitrate of potash, tartarized antimony, or ipecacuanha, and in asthma or dyspnœa without fever, combined with ammoniacum, it is perhaps the best remedy we can employ.

In hydrothorax occurring in persons of an advanced age, especially when there is chronic catarrh, asthma, or cough, and the bronchial tubes are loaded with large quantities of viscid phlegm, expectorated with much difficulty, squills will be found highly

beneficial both as an expectorant, a diuretic, and by promoting absorption. In such cases it may be given in very full doses, so as to keep up nausea, which is conducive, in no small degree, towards a free excretion from the bronchial vessels.

In Pertussis it is very useful. Of the many formulæ recommended for the treatment of this disease, the following has in my hands afforded most relief.

Syrup of Squills,  
Ipecacuanha Wine,  
Paregoric, each equal parts.

Of this a teaspoonful is a dose, taken five or six times a day.

The preparations of squills used are, the oxymel, vinegar, and tincture. The two former are generally preferred, because the other ingredients with which the squill is combined, seem to add to its virtues. The tincture is, however, recommended by many.

The following, forms a very useful pectoral mixture in most cases.

R. Syrup of Squills, ʒss.  
Honey, ʒi.  
Elixir Paregoric, ʒii.  
Antimonial Wine, ʒiii.  
Laudanum, ʒi.  
Water, ʒiv.

A dessert-spoonful to be taken every two or three hours with a little honey, or oftener if required.

*Syrupus Scillæ Compositus*—*Hive Syrup*.—A combination of Senega Snake Root, Squills, Tartarized Antimony, boiled in water and made into a syrup. Thus combined, a preparation has been made by Dr. Coxe, of Philadelphia, and introduced in the American Dispensatory as an officinal article. The efficacy of these articles is much improved by their union, and in cases of croup, and others, where expectorants are required, in doses so regulated, as to produce an emetic or expectorant operation. Very great benefit has been afforded in many cases, and for these purposes, the preparation is well deserving your attention.

For the manner of preparing this medicine, I refer you to Coxe's Dispensatory.

#### OF EXPECTORANTS WHICH OPERATE AS STIMULANTS.

*Family Umbelliferæ*—*Dorema Ammoniacum*—*Gum Ammoniac*.—Is a concrete, gummy resinous juice, which oozes from a plant of the umbelliferous kind, growing in Egypt, Turkey, and the East Indies. It is found in the shops in masses formed of drops

or tears, which are white within, yellowish without, easily fusible, somewhat bitter and nauseous, and of a sharp taste and smell. The white drops or tears are observed to change to a yellowish or brownish colour, on being exposed for some time to the air. It is often met with in the shops mixed with much foreign matter, as wood, small stones, and sand. From them it is separated by softening or dissolving it in a little boiling water, pressing it while hot through a strainer, and then inspissating it to its former consistence. For internal use, the larger and finer tears unpurified, are preferred to the common strained gum.

The virtues of ammoniac have been considered more various than experience justifies. It has been commended for its antispasmodic and deobstruent properties, neither of which does it possess in any degree. As a stimulant expectorant it is better known and appreciated, and it is only in this point of view that it can be considered entitled to our attention.

In various pulmonary affections, when the lungs are oppressed by viscid phlegm, in chronic catarrhs, in asthma, particularly in the pituitary or humid, in pneumonia after action has been reduced, and in peripneumonia notha, it is often of essential service in promoting expectoration and relieving respiration. In these diseases its powers are very considerable, and its efficacy such that it deserves the first place in this division. Triturated with water it forms a milky liquor called lac ammoniac, and in this state is more active than when administered in pills. The following formula is the usual mode of administering it.

℞. Lac. Ammoniac,

Cinnamon Water, a. ℥ii.

Syrup of Squills, ℥ss.

Elixir Paregoric, ℥ii.—ft. mistura. The dose is a large table-spoonful, which is to be repeated pro re nata.

Dissolved in a diluted solution of nitric acid, it is employed in cases where large accumulations of purulent or viscid matter exists, with feeble and difficult expectoration. The formula is as follows:

℞. Nitric Acid, ℥ii.

Water, ℥viii.—this is to be poured upon

Gum Ammoniac, ℥ii. and rubbed down until a solution is made—of this a small spoonful is taken as often as is necessary, mixed with any mucilaginous fluid.

*Polygala Senega.*—Is also a very useful stimulating expectorant. It has an unpleasant and somewhat acrid taste. After chewing, it leaves a sensation of acrimony in the mouth, and still more in the fauces, if it has been swallowed. It is probably owing to this particular irritation of the Senega in the fauces,



the sensation of which is compared to a burning, that the discharge of mucous which takes place, is attributable,—since during its existence much is brought up by hawking. The powers of senega, as an expectorant, are as well established as those of any other medicine. It has for this purpose been employed in several affections, and the reputation it acquired has been well sustained in subsequent trials with it. Introduced as it had been upwards of eighty years since in the treatment of pneumonia, it is still employed with advantage in the pulmonic affections, and most practitioners are agreed upon the decidedly good effects often following its use. The stage of the disease to which it is best adapted is more clearly defined, and it is now considered that it cannot be employed to the exclusion of other active remedies. When these therefore have been pursued to a proper extent, and the patient continues oppressed with a dry cough, or difficult expectoration, a decoction of this article may be resorted to with much advantage. It is also useful in croup as a secondary remedy, and when employed, the decoction should be much stronger than is usually given. The mode of preparing it is as follows :

R. Rad. Senega, coarsely powdered,  $\mathfrak{z}\text{ss}$ . boil it in  $\mathfrak{z}\text{viii}$ . of water to  $\mathfrak{z}\text{iv}$ .—of this a tea-spoonful is to be given every half hour or hour, as the urgency of the symptoms require.

Of this strength it is decidedly expectorant, and it may also excite emesis. The decoction is the best form of administering the senega, though the tincture is often useful in combination with other articles. In ordinary cases, the strength above directed is greater than necessary— $\mathfrak{z}\text{ss}$ . to a pint and a half of water, boiled down to a pint is sufficient—to this such other additions may be made, according to the indications, or the partialities of the physician. The dose is  $\mathfrak{z}\text{ss}$ . to  $\mathfrak{z}\text{i}$ . pro re nata.

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*Lobelia Inflata*—See Emetics.

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*Family Liliaceæ—Allium Sativum—Garlic.*—The virtues of garlic are various. The whole of the plant possesses similar properties, but the root, which has a strong pungent odour, and a very acrid taste, is the only part employed in medicine. Of the many purposes for which it is recommended, I shall only speak of its expectorant, which in common with other articles of the class Aliaceæ, it possesses in a considerable degree. Its utility, in this respect, in the several forms of asthma and other affections, unattended with inflammation, has been long noticed. Thus Dioscorides mentions its use in moderate coughs. Celsus employed it mixed with honey in these complaints, and Rosenstein recommends it to be boiled in milk, and a pint to be taken night and morning. It is, however, not so much in repute among pro-

fessional men as among those who are unprofessional, with whom, made into syrup with honey, it is much employed in catarrhal affections of long continuance, in tussis senilis, and in other cases, and very frequently with advantage. I have never had occasion to administer it, but have known of its employment in several cases with good effects.

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A *Watery Solution of Assafœtida* has been recommended in pectoral affections, for its expectorant properties, and it has been much used in pertussis, chronic coughs, &c. Its good effects rather depend upon its antispasmodic properties, and is advantageously employed in all those affections of the lungs which are attended with spasm. The prescription is as follows :

℞. Gum Assafœtida, ʒss.

Water, ʒiv.—the water is rubbed with the gum until a solution is made. To this is added

Tincture Tolut. ʒss.

Laudanum, gtt. xxx. or xl.

The dose is a tea-spoonful to a child every two hours, and ʒss. to an adult.

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There are several other articles that might be mentioned under this head, but they are either so uncertain or so seldom employed that their enumeration is unnecessary.

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Of the properties attributed to Balsams, none are more ancient and commonly prevalent than those of healing or vulnerary. This idea appears to have arisen from the observation of their use when externally applied to a recent wound. If a wound is made on any part of the body with a clean cutting instrument, and the parts be brought together, and bound up with a rag dipped in any balsam, and left undisturbed for several days, it is a matter of common remark, that the wound will generally heal without any suppuration, by simple union of the divided parts. The same effect would be produced by any other substance similarly employed. Without regarding the effects which followed this approximation of parts, and the exclusion of external air, they were supposed to be possessed of healing powers in a peculiar degree. From their utility thus applied externally, their use was extended to internal affections. But scarcely a single circumstance which recommends their external application, can apply to internal injuries or diseases. Their good effects as external remedies, depend upon the degree of topical stimulus, and probably the exclusion of the external air, and hence the value which is set upon balsams as internal remedies is entirely lost. A languid, indolent ulcer of the kidney might perhaps be assisted by local stimulating remedies, but when the

remedy must enter the stomach, and pervade all the vessels, be mixed with and diluted by the common circulating fluid, the remedy is no longer local, and the irritation which it produces is either counteracted during the circulation, or is equally diffused over the whole system. Balsams, therefore, are no longer viewed with that partiality which the older physicians entertained for them, and repeated experience has shewn them to be sometimes absolutely useless, and often positively injurious in internal affections of different parts for which they have long been celebrated. Used with caution they may be beneficial in several diseases.

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*Family Leguminosæ—Myrospermum Peruiferum et Toluiferum—Balsams of Peru and Tolu.*—From recent discoveries it is ascertained that these balsams are obtained from the same genus, and are similar in their properties. The tree from which the balsam is derived grows in South-America. It is procured by making incisions in the bark from which it exudes in considerable abundance during the hot season. The balsam is of a yellowish brown colour, transparent, in consistence thick and tenacious. By age, it grows so hard and brittle that it may be rubbed into a powder between the finger and thumb. Its smell is extremely fragrant, somewhat resembling that of lemons, its taste is warm and sweetish, and on being chewed it adheres to the teeth. In its composition it consists of an essential oil, a peculiar resin, and benzoic acid. It is this last principle which characterizes the balsams. In common with the other balsams it has been much celebrated for its expectorant properties. It is less heating and stimulating, and may therefore be employed with more safety in pectoral affections than others. The cases to which it is adapted are similar to those to which this division has been considered best suited,—only it is not often resorted to until vascular action has been much reduced, or where but little excitement exists. It is a useful addition to other expectorants, to which it often imparts vigor, and is therefore principally employed in combination. It may be administered alone, suspended in water by means of mucilage or the yolk of an egg.

With it is formed the medicine sold in the shops and known as Hill's Balsam of Honey. The formula is to be seen in Paris Pharmacologia. I have found it very useful in chronic coughs, and the pectoral affections of old people.

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*Balsam Copaiva.*—See Diuretics.

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Having considered the manner in which expectoration is excited, by medicines which exert their action upon the stomach and by their stimulant impressions—I proceed to consider another di-



vision, comprehending those substances which by sheathing the the upper part of the trachea with a bland and viscid fluid, allay that irritation which excites coughing, and by allowing the mucous to be collected, thus appear to promote expectoration. This division will comprehend the mild gums and mucilaginous articles, such as gum arabic, tragacanth, sugar, linseed, liquorice, tussilago and the like. They are most useful when the mucous is of a thin and acrid quality, when there is a frequent and dry cough, with great irritation of the lungs and bronchiæ. There is some dispute about the action of these medicines. It had generally been considered by physicians, until the time of Dr. Cullen, that these substances act upon the lungs through the medium of the circulation. Thus the gum arabic which is in very common use, was proved to extend its soothing qualities to the bronchiæ, and there to allay that irritation which excites coughing. It is, however, more probable that the articles of this class produce their good effects only during deglutition, and that by besmearing the fauces and glottis, they are defended from the various irritations which in their irritable state would excite coughing. In this condition of the membrane, deprived as it often is of the mucous which lines it, the air itself is often an irritant. That it is by supplying the absence of this natural covering, that these substances allay coughing, and remove the irritation previously so troublesome, is proved by the quickness with which the effect follows, and that in so short a period of time, as to render it impossible that the smallest quantity could have reached the affected parts through the circulation. The cough therefore being allayed, and the agitation of the lungs consequent upon it being composed, the mucous which was present in the lungs, becomes more abundant and inspissated, and the strength of the patient being in the meantime somewhat restored, it is easily and copiously ejected with the first slight cough which occurs. I now proceed to their particular consideration.

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*Family Leguminosæ—Glycyrrhiza Glabra—Liquorice.*—This plant is a native of the South of Europe, and is also cultivated in Great Britain. The root is the part used in medicine, and it contains much saccharine matter joined with some proportion of mucilage. When boiled for a short time in water, it gives out nearly all its sweetness—the decoction then strained and inspissated with a gentle heat, affords the extract so commonly met with in our shops. The uses of this article are so well known that it is almost unnecessary to enter upon the description. It is much employed in catarrhal and other pulmonic affections, in coughs, hoarseness, &c., and from its bland and emollient properties, is well adapted to all these cases. It is not

often employed alone, but combined with a variety of other articles for greater convenience and efficacy. The following formula, constituting what is called the Brown mixture, is very commonly employed, and it is a preparation which is often beneficial.

**R. Extract of Liquorice**

Gum Arabic, a ʒss.

Hot water, ʒviii.—simmer until dissolved.

Antimonial Wine, ʒiii.

Laudanum, xl. drops.—ʒss. to be taken every two or three hours.

In this formula the anodyne co-operates with the mucilaginous articles in allaying irritation, while the determination to the surface excited by the antimonial preparation, completes the intentions to be fulfilled in pectoral affections, and thus furnishes us with a very valuable mixture in the secondary stages of these diseases. In milder cases the same articles may be given in the form of lozenges, prepared in the following manner :

**R. Powdered Gum Arabic,**

Powdered extract of Liquorice,

White Sugar, a ʒii.

Powdered Opium, g. vi.

Oil of Anniseed, gtt. iv.

to be divided in 60 parts.

One of these may be dissolved in the mouth three or four times a day or more frequently.

This is the formula of Dr. Wistar, and which is very useful and convenient.

Powdered Liquorice Root is much employed in the composition of pills, and for disguising the taste of unpalatable medicines, which it does more effectually than any other substance.

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*Gummi Arabicum—Acacia vera Succus.*—This valuable article is a concrete mucilage which exudes from the *Mimosa Nilotica*, or *Acacia vera*, a tree that grows abundantly on the sandy soil of Egypt and Arabia, on the rivers Senegal and Niger, near the Cape of Good Hope, and other parts of Africa. The gum exudes in a liquid state from the bark of the trunk and branches of the tree, in a similar manner to the gum which is often produced upon the cherry trees, &c. of this country, and by exposure to the air it soon acquires solidity and hardness. The common appearances of this gum is so well known as not to require any description of it; the various figures which it assumes seem to depend upon a variety of accidental circumstances attending its transudation and concretion. That which is of a pale yellowish colour is most esteemed: those pieces which are of a brownish

or reddish hue are found to be less pure, and are said to be produced from a different species of *Mimosa*.

Gum Arabic is probably the most valuable of all the gums and mucilaginous substances, in coughs, hoarseness and other catarrhal affections, for the purpose of diminishing irritation, and supplying the absence of the natural mucous. On this account it is employed to allay the tickling sensation in the fauces, which so often excites coughing. It is therefore much resorted to in the formation of pectoral mixtures, and is a very useful adjuvant. It is combined, as I have already mentioned, with several articles.

Gum Arabic is employed to suspend in water a number of substances, which would not otherwise be kept equally diffused in this fluid. It is also useful in rendering miscible with water the balsams, resins, fixed oils, and similar substances, whereby they may be very commodiously taken in a liquid form. This article is considerably nutritious—in the countries where it is native it forms an important article of food, either by itself or mixed with milk, rice, &c. Hasselquist relates an instance of the travellers of a large caravan, who had consumed all their provisions in the middle of their journey, through the deserts of Africa, preserving themselves from famine by gum arabic, which they were carrying as merchandize.

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*Gum Tragacanth.*—This is so nearly allied to Gum Arabic in its properties, that a particular description is unnecessary.

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*Family Lineaceæ—Semina Lini—Flax Seed.*—Is the product of the *Linum Usitatissimum*, a plant which is a native of Great Britain, but is cultivated in many parts of Europe and this country. It is a plant of great utility for purposes in the arts to which it is subservient. The seeds which it furnishes have an unctious sweetish taste, but no remarkable smell. On expression they afford a large quantity of oil—boiled in water they yield much mucilage—the mucilage residing chiefly in the cuticle of the seeds.

Infusions and decoctions of these seeds, like other vegetable mucilages are used in coughs, hoarseness, and pulmonary affections generally. They are of considerable benefit in many of these cases, and when sweetened with honey, and acidulated with lime juice or vinegar, are not very unpalatable. They may be drunk freely, and are useful in allaying irritation.

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Besides the articles I have mentioned there are several others, which are much employed for the purposes already detailed, as almonds, spermaceti, mallows, the seeds of quinces, slippery elm, &c., which as they possess only mucilaginous properties, need not be particularized further.



INHALATIONS.

Hitherto I have been considering the articles which have been employed and are doubtless of great utility in allaying irritation,—in lessening the inordinate secretion from the lining membrane of the trachea and bronchiæ, and promoting its expectoration. Under the head of inhalation we advance a step further, and will bring to your notice remedial measures, which will change the morbid action existing, and substitute a new and a healthier one, will promote the healing of ulceration, provided it has not extended into the parenchyma of the lungs—and by attacking the sources from which the bronchial discharges have issued, diminish and finally prevent them. The great utility of applications in promoting the curative action of ulcers situated on the external parts of the body, has frequently been noticed, and by a parity of reasoning we would be led to suppose, that if they could be made to the surface of the lungs, in a manner adapted to their greater degree of irritability, similar good effects would result. Every day's experience convinces us that the improvement which takes place in the constitution of those labouring under pectoral complaints, by changes of climate, by long voyages, arise not more from the changes which are made in the circulation, than by the passages to the lungs being also stimulated, by new actions being excited, through their whole extent, and ulcerations healed which had long existed. From these circumstances, we may suppose that the dissemination of stimulating effluvia in the apartments of those labouring under pulmonary complaints, when the matter expectorated indicates that the ulcers evince a depraved condition, would be highly serviceable, not only to cleanse the sores, promote the healing action of their surfaces, and prevent or diminish the acrid secretions—but that they would facilitate the expectoration of such matters as lodging in the bronchia, render the breathing oppressed and difficult.

The great object in the treatment of every disease is to change the existing action, to direct our remedies in such a manner that by their strong impress upon the system, their operation may be substituted for the diseased, and health be finally restored. This object can often only be effected by cautious, steady and persevering exertions, and in no diseases are these directions more necessary than in those of the lungs. The period in the disease for the employment of inhalations will be after the inflammatory symptoms have passed off, and the disease begins to assume the chronic form. By such means, strenuously and judiciously maintained, the most beneficial effects have resulted in chronic affections of the breast.

Inhalations of the mildest character consist of water in the state

of vapour, either in its simple state, or containing other substances with a view to a more stimulating action. In many cases these means are often of great benefit in promoting difficult expectoration, by relaxing the bronchial vessels, and occasioning thereby a more copious secretion, by which the viscid contents of the lungs are altered, and their liberation more readily effected. The vapour of water, or vinegar and water, inhaled through the spout of a tea-pot, or a funnel inverted over a bowl, or Mudge's inhaler, (for a good model of one, see *Edinburg Medical and Surgical Journal*, No. 75,) may be usefully employed in cases where these objects are desired, and the relief afforded is often very considerable.

The Vapour of Spirits has been much used in Chronic Ulcerations of the lungs with great advantage.

Spirits impregnated with various active articles have also been employed in these cases.

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The Tincture of Digitalis, united with the vapour of water, has been inhaled into the lungs either by Mudge's inhaler, or by the use of sponge.

Ether in which cicuta is dissolved has also been employed, where a stimulating expectorant and antispasmodic is required. Dr. Chapman speaks of the utility of this remedy with some confidence in dyspnœa and in pulmonary complaints. Of its utility I can say nothing, having neither seen nor known of its employment.

The fumes of terebinthinate substances have been employed in catarrhal affections, and in diseases of the chest more extensively, and from the various reports upon the subject, with effects highly salutary. From their less stimulating properties, they may be employed more frequently, and the occasions in which they may be resorted to are more common than is supposed.

In conjunction with other remedies, the fumes of rosin are often highly beneficial in the catarrhal affections of children. They are often received with pleasure by the infant, and seem to produce an immediate improvement of the breathing. If the effect is not salutary, the patient may easily be removed beyond the influence of the fumes. The manner of administering the remedy is simply to fill a room with the smoke of rosin, and allow the patient to remain in it as long as is necessary.

The fumes of tar have also been employed in the same cases, and in pertussis. In pulmonary consumption this article has been employed with success in Petersburg, Russia, and it is confidently stated that patients have been restored after their lives had been despaired of by the most eminent physicians of that kingdom. Sir Arthur Clarke speaks of its use in three cases of con-

sumption, in St. George's House of Recovery in Dublin, and he states that from the experience he has had, the tar fumigation renders the cough less troublesome, and produces very salutary effects on the pulmonary system. The manner in which the fumigation is directed to be conducted is, to put the tar in an open vessel over a lamp or hot iron, so as to produce a slow volatilization, until the air of a chamber is well impregnated. In this atmosphere the patient may remain one or two hours together, two or three times a day. In a similar manner it has been employed in pertussis, and its effects are spoken of in very high terms.

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The inhalation of the effluvia from raw muscovado sugar, has been recommended by Dr. Chisolm in cases of phthisis. He has known it produce a wonderfully soothing effect, which has in some instances become permanent. In the West Indies he recommends lodging the patient near the boiling house of a sugar plantation, or where this is not practicable, a small barrel or even a basin, filled with the coarsest or dampest muscovado sugar may be placed in the corner of the room occupied by the patient. In changing the climate, a sugar laden ship should always be preferred.

Besides this mode of applying stimulating substances to the lungs, it has been proposed, and even practised, to introduce into the lungs various articles in the form of powder. Dr. Darwin invented a box for the application of powders to the surface of the lungs, for the cure of ulcers, &c., and the practice has lately been revived by a practitioner from New-England. The mode, however, of impregnating vapour with medicinal herbs has many advantages, and this more especially, since there are few substances the active principles of which may not be dissolved and applied to the lungs through the medium of vapour.

Such are the remedies which have been commonly resorted to for the purposes of inhalation. It is a practice but little resorted to at present, much less than it deserves, and I hope, that with the views which have been given of its operation, it may excite more general attention.

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## DIVISION XI.

### EPISPASTICS.

THE idea of applying to the surface of the body, a substance, which, by producing considerable irritation, was calculated either to displace or equalize in any manner the force of morbid excite-



ment, embraces one of the most important pathological principles in the practice of our profession. With whom it originated is not very accurately known, but the honor is most probably due to Hippocrates, since the idea is frequently expressed in many parts of his works. When applied to practice, it furnishes us with resources the most extensive in therapeutics, and presents us with a very favorable specimen of the state of medicine in the days of ancient Greece. The substances employed by the Greek physicians, as epispastics, were derived from acrid and irritating vegetables, from the actual cautery, and other means equally severe and pungent. It was not until the science was more advanced that the more common practice, that of employing cantharides, came into vogue;—their introduction into the *Materia Medica* being attributed to Aretæus, a physician of judgment and learning, who flourished a little before the time of Galen. The method employed by him, consisted in rubbing them on the part until a blister was produced. This method, I need not inform you, is now rejected, and the present mode of applying them did not prevail much in practice, until the beginning of the sixteenth century. Disputes which existed respecting the employment of blisters in a plague which prevailed in Italy about the years 1575 and 1590, directed the attention of medical men more particularly to their consideration, and laid the foundation of a more accurate acquaintance with their virtues and operations.

The term epispastic from the Greek word *epispaio* to draw, signifies applications which draw the fluids more copiously into the parts to which they are applied. It may therefore be considered one of pretty extensive import, comprehending not only blisters, properly so called, but sinapisms, issues, setons, and caustics; each of these in their proper places and in states of disease furnishing us with very important means in a curative point of view. Of these, however, blisters are the epispastics most commonly employed, and they are so designated because their most sensible effect is to determine upon the skin the formation of vesicles which are filled with a humour of the colour of amber. The manner in which this effect takes place seems to be by stimulating the arteries to an increased secretion. This is evident from the symptoms which follow the application of a blister. The skin exhibits all the signs of great irritation—it becomes red and very sensible—the blood circulates with so much activity that it penetrates all the cutaneous capillaries, and the exhalation becomes more abundant. As the natural texture of the skin becomes altered, it is no longer permeable to the fluids which the exhalents carry off, the fluids therefore detach it from the *cutis vera*, they raise it, they accumulate under it, and form the vesicles which the blister plaster covers. This local action is not the only

effect which the use of blisters offers to our attention. They exercise a considerable influence upon the system at large. The pulse becomes fuller and more frequent; the animal heat is augmented; many of the organs exhibit the effects of a stimulant impression, and evince by their accelerated movements that they are stimulated and irritated.

The *modus operandi* of blisters, in the cure of diseases, has been the subject of considerable discussion. By some it is contended that their beneficial effects are to be attributed to the local and general excitement, producing new determinations of the fluids, or altering and subduing morbid action. According to others, much of the benefits derived from blistering are attributed to the evacuation of serous fluids which follows their application. Without embracing either of these opinions, I may be justified in stating, that there are cases in which advantages are derived from all of these modes of operating. That from their general operation, they are capable of rousing the powers of life, of communicating to the system an advantageous impression, and of giving to the circulation and the other functions more energy and activity. By this topical impression they are capable of changing the afflux of fluids upon a part which might become fatal, to displace a painful inflammation fixed upon an organ essential to life, and to render it superficial, exciting disease on a part of the body where it may exist without danger. That advantage is derived from the discharge, we infer from the beneficial effects which follow issues and setons, from the blistered surface becoming in fact an excretory organ, to which not only an increased determination has been made, but by which the over-distended and inflamed vessels are enabled to relieve themselves of their contents. "So long therefore as the discharge continues, so long will there be an especial demand for blood in the blistered part, and a consequent derivation of the circulation from the inflamed and engorged vessels of the neighboring organs." These different effects of blisters will be fully illustrated when I shall speak of their practical application.

The beneficial operation of blisters may be arranged under the following heads.

1. Where the actions of the system threaten to become too weak.
2. Where they are irregular.
3. Where they are partially too strong.

Under the first head their utility is manifested in the advanced stages of Typhous or other continued fevers. In Typhous fevers blisters become very useful, when the powers of the system shew a tendency to prostration, when the contractions of the heart become languid, and the patient struggles under anxiety, rest-

lessness, delirium, difficulty of breathing, &c. These symptoms are the result of rapidly increasing debility, and strongly point out the necessity of cordial remedies, with stimulating applications. Blisters seem to be best adapted to these cases as rubefacients. To obtain this effect their situation should be frequently changed, and after being applied four or five hours to one part, should be removed to another. They may be applied successively to the legs, the thighs, upon the arms, to the back, so as to renew each time their general action. It is under these circumstances, less the local impression which we desire, than the advantageous changes produced in the state of the circulation, and in the other functions of the body. Of late the delirium which so commonly attends in the advanced stages of this disease, has been considered as more effectually treated by blistering the whole surface of the cranium. In this disease the brain appears to be the organ which is chiefly disordered—many of the distressing symptoms which occur during its progress, having their origin either in the state of sub-acute inflammation which exists, or the state of congestion. The utility of blisters in such conditions is very decided, and the nearer that the application is made to the diseased part, the greater benefit will be derived. They will be found useful in determining from the part, and giving an impulse to the restorative powers of the animal economy.

In Continued Fevers, blisters, judiciously managed, are of great advantage. Without proper attention to the time in which they ought to be employed, they would be productive of much distress to the patient, without any relief following their application. As a general rule they are inadmissible in the commencement of these diseases, and their use should be deferred until the action of the heart and arteries has subsided. There is a state between the reduction of excitement, and the appearance of symptoms of prostration, in which they afford the greatest benefit. Morbid action seems in this state so to have fixed itself, that the natural powers of the system are incapable of relaxing themselves from its thralldom.

These actions, from their continuance, seem to have established a kind of habit, which would run on to exhaustion, unless their course was interrupted. It is in such states of continued fevers that blisters exert a renovating impression, and by changing the existing action tend greatly to subdue it. They are applied with most advantage to the calves of the legs, the inside of the arms, or the back of the neck. Such parts of the body being generally preferred as the most convenient, and from their situation and connections, those upon which the most favorable impressions can be made.

In Remittent Fevers, when they have been of long continuance



and the spirits and pulse of the patient begin to flag, they have been successfully employed. Of their utility Dr. Lind speaks in high terms, and observes that a remission soon follows their application. Dr. Rush, in his account of the bilious remitting fever of the year 1780, informs us, that he always had recourse to blisters, if the fever did not intermit after the fourth or fifth day. They seldom failed of producing an intermission in the fever the day after they were applied. He thought that more immediate good effects were derived from blistering the neck and behind the ears.

In some of the Eruptive fevers the utility of blisters is particularly manifested. In the Small Pox, where the patient is of a lax and weak habit, when the pulse is low, feeble and depressed, and the fever insufficient for the expulsion and suppuration of the pustules, epispastics are certainly indicated. Dr. Mead also observes that whenever the maturation of the pustules does not regularly succeed their eruption, and when anxiety, inquietude, difficulty of breathing, and delirium come on, the fever should be quickened by warm cordials and especially by the application of blisters. Many other authorities, as Sydenham, Morton, and others, may be adduced in favor of the good effects of blisters under such circumstances. They are useful not only in preventing unpleasant symptoms, but are capable of relieving them when present. They, as I have stated, not only promote the maturation of the pustules, but when the fauces are covered with them, and both deglutition and respiration are impeded by the swelling of the throat, blisters, when applied to the neck, are highly serviceable.

In the advanced stages of Inflammatory fevers, when the patient becomes languid, and perhaps comatose, blisters are highly beneficial. They are found useful in relieving many of the symptoms of this state, particularly those obstinate and oppressive headaches, which have resisted every previous evacuation, and which often continue to the last period of the disorder.

These remarks sufficiently illustrate the utility of blisters in the diseases I have spoken of. The same observations are equally applicable in every other species of fever, where such a train of symptoms occur, as have been already described.

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The second division of diseases in which the use of blisters is indicated, is where the actions of the system are irregular. This division will comprehend a great variety of cases in which, from unequal excitement either of the nervous or vascular system, symptoms diversified, according to the seat of the irritation, will be produced. It is evident that under such circumstances they will manifest very decided and efficacious powers, since if we

deny to them all other modes of operation, at least we cannot dispute their tendency to restore an equilibrium in the irregular determinations of diseases. These remarks will be better illustrated in considering the diseases which arise from irregular action.

Convulsive diseases most commonly have their origin in some irritation of the cerebral system. They generally proceed from undue determinations of the vascular system to this part, or such a degree of irritability as to be excited into irregular actions by the usual stimuli of life. Whatever, therefore, will abstract from this organ, will seldom fail to afford relief, by lessening or destroying the sense of that irritation. Blisters, therefore, are indicated in such cases to stimulate and excite pain in a part of the body that is sound; for according to the aphorism of Hippocrates, *Duobus doloribus simul abortis, non in eodem loco, vehementior obscurat alterum*.

In Epilepsy the use of blisters is too much neglected. Their utility is recommended by Hoffman, Mead, and other more modern writers. Their effects are most beneficial when applied to the arms, and I have little doubt that their continued repetition would be of decided benefit. In the convulsions which precede the eruption of small pox, blisters act as powerful antispasmodics. But they should not on slight occasions be employed in this state of the disease, lest by their stimulus they aggravate the fever, and increase the number of pustules.

In apoplexy, in mania, in hydrocephalus, their beneficial effects are well established, and from the peculiar obstinacy of these cases, a single application is not sufficient, but they should be applied successively until the morbid action is subdued.

In those affections of the alimentary canal designated by the names of cholera morbus, dysentery, colic, and diarrhæa, blisters cannot be too much commended. In no cases are the sympathetic connections stronger, than between the skin and the mucous membranes. In those diseases of the internal coat of the alimentary canal the powerful influence of blisters is well known. In cholera morbus and dysentery the application of blisters should never be omitted. They considerably lessen the pain and spasm, however excruciating, by a diversion of it to another part.

In colic they afford quick and certain relief, and it has been observed by some writers that very soon after their application, purgative medicines have more certainly produced their effects.

In diarrhæas, particularly of the chronic kind, they are greatly to be depended upon. I have seen the most happy effects from their use, and Dr. Rush speaks of the very essential benefit afforded by them in such complaints. They are most advantageously applied to the inside of the thighs, and they should be kept discharging for a considerable time.

The third division of diseases in which blisters are useful, is where the actions of the system are partially too strong. This division will comprehend all those cases in which there exists local determinations to particular organs, and other parts of the system. The frequency of these determinations must have struck your attention in your intercourse with the sick, and it is from their consideration that divisions of diseases are founded, and upon them that systems of nosology are established. They constitute therefore a very essential point in the treatment of diseases, and it is to their relief that our care must be directed. The necessity of these directions will be obvious, when you consider that there is no constitution which has not its particular weak point, upon which the violence of disease is frequently expended. The utility of blisters will therefore be apparent, since they so well support the constitutional remedies which are employed, and lend such important aid to our means of cure. The cases which are comprised under this head, will consist of diseases connected with Inflammatory action.

Before proceeding further, we may enquire, at what period in inflammatory diseases ought we to have recourse to these remedies. From inattention to this circumstance, there has existed much contrariety of opinion, as to the benefit conferred by blistering. For applied, as they too often have been, when the system laboured under much arterial excitement, from the general operation of blisters already pointed out, they have tended to do harm; when applied after that action has nearly ceased, they do but little service. To be serviceable therefore, they should not be employed, until the phlogistic diathesis has been so much reduced by depleting remedies, that the irritation produced upon the skin, will, instead of proving a stimulus to the complaint, rather serve to counteract the excitement existing in other parts of the system, and by giving a centrifugal direction to the fluids, save parts essential to life. It is therefore, by common consent agreed, that blisters are improperly employed before arterial action has been sufficiently reduced, and the excitement lowered to what Dr. Rush has called the blistering point. I should enlarge more upon this subject, but it is one which from its importance will be enforced upon you by the professor of practice.

The diseases of high local action in which they are applicable are the Pulmonic Affections. In these cases our chief dependence should be upon bleeding frequently repeated, and we should avoid the early use of blisters. But when the disease has continued some time, when bleeding gives but little relief, the pulse becomes small, and the patient unable to bear further evacuations; under such circumstances epispastics will produce remarkably good effects. If there be no particular pain, but only a general



oppression, the vesicatory may be applied to the back, and afterwards, if the disease be obstinate, first to one side and then to the other. When thus applied, they will be found to relieve the chest, promote expectoration, and lower the pulse.

In Inflammation of the liver, stomach, and intestines, one of the best remedies is a large blister, applied over the part affected. They afford very great relief in such cases, and next to blood-letting, are the most valuable agents we can bring to our assistance.

In Rheumatism, blisters do much service, and should always be had recourse to. They create a diversion of the diseased action, and thereby mitigate those acute sensations of pain, and that stiffness which attend this disease. They should be applied over the part complained of, and be repeated as often as occasion may require.

In the various Anginose affections, the utility of blisters is well established. In sore-throat, in croup, in scarlatina anginosa, and other diseases of these parts, they are confidently applied, and the great relief which arises from their use, entitles them to the consideration of very important means in the treatment of these cases. In the scarlatina anginosa which prevailed in Philadelphia, in the years 1783 and '84, Dr. Rush always derived great advantages from their use. He applied them to the neck or behind the ears.

In Erysipelas they are employed with remarkably good effects. In affections of the head and face, from this complaint, applied to the back of the neck, they have been highly beneficial. When attacking other parts of the body they are applied over the affected surface, and when this is very extensive, with a rapid extension of the disease, a strip of blister placed along the margin of the inflammation, is very efficacious in arresting its progress.

In Ophthalmias, the benefits conferred by this mode of deriving from the affected part, are well known.

Besides these diseases blisters may be employed advantageously in many others, and particularly those of a local nature. To extend the further consideration of this subject would take up more time than is necessary, and I trust I have said sufficient to impress you with the importance of the remedy. I shall merely add a few remarks upon the connections of the skin with the general system, as tending to enforce the importance of vesicatories.

The sensibility of no part of the system is more remarkable than that of the skin; this part of the body being truly said to be the theatre of various functions and phenomena, over which this extraordinary faculty presides without ceasing. The abundant sensibility with which the skin is possessed, seem necessary to support the activity of various functions which are continually in

operation—to favor the course of the fluids in the capillary vessels—to promote the secretion of a sebaceous humour—to excite into action the processes of absorption and exhalation—to determine the exercise of the sense of touch, and to establish the sympathetic connections of the skin, with the internal parts of the body. Each of these functions would furnish us with ample materials for consideration, but it is only of the last that I propose to treat. The sympathy most commonly acknowledged is that which exists between the skin and the mucous membrane of the alimentary canal. This is obvious from the disgust, the nausea and vomiting, which follows the existence of various exanthematous disorders, and from various cutaneous eruptions being produced by substances taken into the stomach. It is evinced by the introduction of warm drinks into the stomach, favoring the function of exhalation upon the skin, and the introduction of cold drinks, suspending, in a sudden manner, the same function. Upon the same principle, a bath taken at an improper period, often interrupts the digestive process.—*Barbier's Materia Medica.*

A considerable sympathy exists between the skin and urinary bladder, and this connection is often taken advantage of in suppression of urine, relief being frequently afforded by causing the patient to stand upon a cold floor, or marble slab. The connection between the skin and lungs is exhibited in the frequent metastasis of disease from this organ, to the respiratory system. The connection between the skin and brain, is exhibited in the delirium which accompanies certain inflammatory eruptions, as the small pox, the measles, scarlet fever, &c. Lastly, there is a considerable connection between the skin and the genital system. It is well known that persons affected with the itch, with leprosy, and other cutaneous diseases, are often troubled with priapism, and an inordinate desire for venereal pleasures. Attention to these sympathetic connections of the skin, with all the living parts of the body, will render this subject doubly interesting, and will satisfy you, that the importance of blistering has not been too much overrated. It will satisfy you that it is not only the local operation which is to be considered, but that by them, great and important changes are promoted in parts of the body very distant, and seemingly but little connected. It shews the harmony and order which reigns throughout the animal system, and our great obligation to that Being who has caused the instruments of relief, and the structure of our frames so happily to agree.





## DIVISION XII.

## STIMULANTS.

Having completed what was necessary to be said on the articles which promote particular secretions, I shall proceed to speak of those, the action of which is general and diffused over the system. The medicines of which I am now to treat, exhibit their effects upon the several systems of the body, as the arterial, the nervous, the muscular, &c., those of which I have spoken have their operation upon its parts.

By the term Stimulant, is meant an agent endowed with the power to increase the mobility of the system, or, in other words, to excite sensation, motion and thought. It is not to be supposed that the articles of this Division differ only in the degree, in which they are capable of producing these effects, but in each is to be observed not only a difference of power, but also in their specific operation upon the system. Thus, to some belong the property of exciting the action of the heart and arteries, of producing warmth upon the surface, and with these a renewal of the vital energies. These are what I would denominate Stimulants or Incitants. Others, in addition to these general effects, manifest a particular action upon the sensorium commune, or general nervous system, as evinced by the property of inducing sleep, allaying pain—these are called Narcotics. Others, besides a stimulant operation, have the effect of allaying irregular muscular contraction; and to these is applied the term Anti-spasmodic. To the head of Stimulants may be referred two other classes of medicines, the operation of which is more slow and gradual, but their effects are equally obvious. These are Tonics and Astringents. Under this term then, we have arranged 5 classes of medicines, each of which I shall consider in their order.—*Murray's M. M.*

First of those called Stimulants, or medicines increasing the action of the heart and arteries.

Stimulants produce their effects by an impression upon the nervous energies of the stomach, which being communicated to the sensorium, is thence diffused over the system. The operation of these substances is too rapid, to admit of the supposition of their introduction into the circulation. By the impression upon the stomach through the medium of the nerves, the vital energies are excited, as is evinced by the activity of the mental and corporeal powers, the increase of the force and vigor of the pulse, by the general determination of blood to the surface of the body, producing heat, flushing and even perspiration. From a knowledge of their effects, we judge of the diseases to which they are applicable. Employed with caution, they become very valuable in those cases

of debility succeeding fevers, or other violent diseases, when the morbid action ceases and no organic disorder remains. •

At the present time it is so fashionable to attribute all diseases to inflammation, that it might almost be questioned whether such a class as Stimulants should be retained. I confess that I am not so much a convert to the physiological system of medicine, as to admit of their exclusion from practice. I still, however, consider that they are less necessary, and that their administration should be more cautiously regulated than has been usual. This is more particularly the case when we reflect that all the symptoms of prostration, may be produced from irritation or inflammation of particular organs. Take for example typhus, and the low forms of fever generally. The symptoms most strongly characteristic of these diseases, arise, in lesions of the cerebral, spinal and nervous systems. Inflammation of these systems is followed by great prostration of strength, frequent pulse, excited skin, depraved secretions, stupor, coma, convulsions—and it is for the relief of these very symptoms that stimulants are so frequently employed.

There are other cases, however, where typhus is strictly adynamic, and in which the free use of stimulants becomes necessary. These cases are however rare, compared with the acute forms of the disease. The symptoms are great prostration of the muscular and nervous energies, delirium, hæmorrhage, scattered petechia, soft, fluent pulse, heat of the skin little increased or below par. Under these circumstances it is necessary to administer Stimulants, and often to a considerable extent.

It is obvious, therefore, that in the employment of these medicines much discrimination is required, and that until a correct diagnosis is drawn, mischief rather than benefit must arise from the use of Stimulants. The practitioner, therefore, should make himself acquainted with the Pathology of disease, and that he may be guided in his researches, he must have recourse to the productions of the French school. He will be much assisted by Goupil's exposition of the modern doctrines, Broussais on chronic inflammation, Louis on Gastro Enteritis. But though Stimulants are improper while inflammation exists, yet they become proper at its decline, to put an end to the relaxation and inaction which occur in parts that have been long stimulated. Under these circumstances the powers of the constitution languish, the circulation is feeble, and the digestive function is weak. The functions here, are materially assisted by a supply of gentle stimulation, and it is then that they are useful and safe.

## OF PARTICULAR STIMULANTS.

*Carbonas Ammoniæ—Carbonate of Ammonia.*—Of this preparation I have already spoken under the head of Diaphoretics, and stated to you that it was formed by uniting together hydro-chlorate of ammonia and carbonate of lime powdered, in a retort, and subliming with a heat gradually raised into a receiver kept cold. In this process a double elective attraction takes place, the hydro-chloric acid of the ammonia combining with the lime, and the carbonic acid of the lime uniting with the ammonia, which is sublimed in the process, and collected in the receiver.

This medicine is a very active Stimulant, and has been employed in a variety of cases with great advantage. It may be used in some form in almost every febrile affection, but is peculiarly adapted to the *low or nervous fever*. In the early stages of this disease, there is increased action, insomuch that Stimulants are inadmissible, and the treatment will depend upon moderate purging, diaphoretics, &c. But afterwards, when the more truly typhus state comes on, vol. alkali alone, or with wine, is decidedly a very useful medicine. The usual dose is grs. v. every second hour, but it may be given to the extent of grs. x. every hour, and even every half hour. As its effects are evanescent, perhaps more so than those of any other medicine except ætherial preparations, the doses ought to be small and frequently repeated. “In one respect the vol. alkali differs from every other article of the class to which it is attached, which is, that though it is a powerful stimulant, it excites an action which approaches nearer to health than any of them. On this account it may be used earlier than any other medicine in inflammatory affections, and with greater safety in mixed cases, than most others of this class.” It may be given in pills, or what is preferable in the form of julep, according to the following formula.

℞. Carbonate of Ammonia, ʒi.  
 White Sugar, ʒiii.  
 Mucilage of Gum Arabic, ʒvj.  
 Spts. Lavend. Comp., ʒii.—mix, and make into a mixture. The dose ʒss. every hour or two.

In other forms of fever, as in Intermittents, it has been recommended, and it is said that when given before the period of accession, it either prevents the paroxysm, or mitigates its violence. The practice I have not imitated, but I have employed the spiritus mindereri during the hot stage, and with great benefit, in bringing on copious perspiration.

In Remittents the vol. alkali is very useful, when there is any tendency to typhus.

In some of the Inflammatory affections this article has been



recommended. In pneumonia, after action has been subdued by depleting measures, when the expectoration is deficient, the skin dry, and the pulse small, the volatile alkali has been given with the effect of promoting perspiration and a more free expectoration. In that form of pneumonia called the typhoid, which prevailed throughout the Union several years since, this article, in conjunction with other sudorifics, formed the most successful plan of treatment. The practice pursued in this disease was the administration of an emetic in its commencement, particularly if pneumonic symptoms attended—a gentle purgative was then employed if required. After this, the most active means were pursued to produce diaphoresis, the discharge being continued until the violent symptoms abated. Nothing answered so well for this purpose as Dovers powder, followed with wine whey, and hot fomentations to the extremities. When by these means sweating was produced, the cure was almost certain. In the advanced stages of the disease, Stimulants became necessary combined with diaphoretics, and here it is, that the vol. alkali exerts its best effects. It becomes in these cases the unicum remedium, and should be employed in doses of 5 or 10 grains every half hour with a plentiful use of wine whey, wine, &c.\*

In many of the affections of the Alimentary canal, the Carbonate of Ammonia has been employed with advantage. It is given in flatulent colics unconnected with inflammation. In cardialgia depending upon acidity, and in the same affection when it occurs in the early and late stages of pregnancy, this article combined with magnesia and other substances has been found very efficacious. The following is the usual formula. *R. Aq. Ammon., Calcined Magnesia a ʒi. Aq. Cinnamom. ʒii. Aq. font. ʒv.—ʒss. to be taken whenever the uneasiness is experienced, and by taking a dose after each meal, the recurrence of the uneasiness will be prevented. It is also productive of good effects, says Dr. Paris, in those gastric affections, which supervene upon habits of irregularity and debauch, and it is equally useful combined with opium in protracted diarrhoea, attended with debility of the Alimentary canal.*

In chronic rheumatism, the utility of this substance is well known, in combination with guaiac, in the form of the volatile tincture. Dr. Barton was in the habit of employing the Carbonate of Ammonia uncombined with excellent effect in this disease, and it seems to be well adapted, given in large doses, to cases of muscular atony, so frequently witnessed as the sequela of chronic rheumatism.

In hoarseness depending upon relaxed states of the throat, beneficial effects have been obtained from its use. Besides these, the

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\* Chapman's MSS.

vol. alkali has been recommended in almost every one of the diseases of the class Neuroses, but I do not know that it is useful in any, but as a palliative in hysteria, and a Stimulant in syncope.

Ammonia has lately been reported by some continental physicians, as possessing the power of quickly bringing an *intoxicated man to his senses*. Further experience, however, has not tended to confirm this statement. Mr. Chevalier of Paris has recently published some cases, showing the total inefficacy of the Ammonia, while a few others, rendered it probable, that the medicine had considerable effect in dissipating the vinous hallucination. What the circumstances are which render the Ammonia inert in one case, and efficient in another, have not yet been ascertained. Sixteen or twenty drops have been given at a dose, diluted in a wine-glassful of water and repeated *pro re nata*.

Lastly, in the bites of venomous reptiles it has been recommended. On this subject there is much difference of opinion among physicians. It has been extolled in the East and West Indies, and large doses are recommended internally, while the part is bathed with a solution of the caustic alkali, and popular opinion is in favor of its utility.

The Abbe Fontana thinks, from numerous experiments, that these preparations used internally, and externally, are injurious. Mr. Home considers that this article is unable to contend with such an affection. Such would be the opinion I should express, though I can say nothing from experience. I cannot think that its prudent administration could be injurious—it may be useful by exciting perspiration.

The Ammonia applied externally, may be beneficial by uniting with the matter of the poison, which is probably of an oily quality, and thus neutralizing it.

To account for the mode in which various articles have obtained a reputation in these cases, I shall make a quotation from some remarks of Dr. Barton, one of the very early naturalists of this country, upon this subject. He says that in the seasons of supervening languor, and torpidity, the rattle-snake in particular bites with seeming reluctance, and without any, or with but little ill consequences arising from the wound. Even in those seasons in which the sun powerfully exerts its influence, at which times these animals are best qualified to strike, and to injure, individuals of the species must often be found, the cavities of whose venomous fangs are entirely, or nearly destitute of their active poison, from the introduction of which into the system, those alarming symptoms which characterize the successful bite of the animal arise. These observations enable us to explain the manner in which this, with other articles, as the Seneka snake-root, have obtained such repu-

tation in the bites of venomous reptiles. Persons have been bitten by those animals when they were nearly harmless, and their recovery after the administration of these articles, has been attributed to their salutary operation, when, if it had not been used, no ill consequences would have ensued.

I have thus pointed out the principal diseases in which this medicine has been employed. A variety of others have been mentioned by most writers on the subject, but I think we are in possession of other remedies better adapted to their treatment, and shall omit their enumeration.

The preparations of this article in common use are, the concrete volatile alkali or Carbonate of Ammonia—prepared in the manner I have mentioned—the dose is from 5 to 15 grs. given in the form of pill or julep. 2d. The Aqua Ammonia, the dose is from 10 to 20 drops.

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*Camphor.*—This article has been variously arranged by different writers on the M. M.—by some placed among the Narcotics, and by others among the Anti-spasmodics. The present situation seems to be the least objectionable, as the property most strikingly exhibited is its Stimulant. Its natural history I have already spoken of, and shall refer to what was said on that occasion—vide Lecture on Diaphoretics, Part II., p. 212.

Camphor has by many been considered sedative in its operation, and the opinion has been extended from one writer to another without duly considering its nature. When the sensible properties of this article are considered, it will appear somewhat extraordinary that such an opinion should have been entertained, since no medicine evinces more evidently stimulating properties. When taken in the mouth it has an acrid taste, and though by its evaporation it excites a sense of coolness, yet a degree of heat remains in the mouth and fauces, and when swallowed some pain and uneasiness is experienced, which is probably owing to its stimulating the upper orifice of the stomach. In small doses it produces much general excitement, and if pushed very far it brings on convulsions, delirium and death.

The operation of this article is somewhat peculiar. From its sensible properties it is undoubtedly Stimulant, yet it does not exert as much influence upon the sanguiferous system as is commonly supposed. It has an action upon the brain and nervous system in such a degree as to be considered one of the Sensorial Stimuli, and it is probably from its operation upon this part of the system that its good effects in diseases depend. This action upon the sensorium is different from that of the Narcotics in moderate doses, since it is not always followed by a disposition to sleep.



Upon the whole, I must consider Camphor in its effects as well as its composition to be *sui generis*, and believe that from these it is better arranged under this head than any other.

It was at one time much used in Fevers, but it has been neglected of late, and much more so than it deserves. It has been most frequently employed in the *malignant forms of fever*, particularly such as are attended with marks of great debility, or prostration of strength, and for the relief of these symptoms, is by some much preferred to the vol. alkali. Both are no doubt admirably adapted to meet the indications in such cases, and they may be employed alternately, in order to avoid losing their power, by the system becoming habituated to either. When employed for this purpose, the following formula will be the pleasantest mode of administering it.

℞. Camphor, 3ss.  
Powdered Gum Arabic and  
White Sugar, a ʒii.  
Or Sweet Almonds blanched, two dozen.

These are to be well rubbed together, by which the Camphor is reduced to a fine powder. Add

Mint Water, ʒvj.  
Laudanum, xx. drops.

As the Camphor rises to the surface of the mixture, it should be strained and two tablespoonsful taken every 2 hours.

This is a very pleasant and useful mixture, extremely well adapted to these cases, and I think preferable to the vol. alkali.

In what was once termed putrid diseases, Camphor was much celebrated, as an Antiseptic. In gangrene it is recommended by the German physicians to promote a separation of the slough, and it is employed internally, and externally by sprinkling the powder on the part, or bathing it with the Tincture. But it is less used for this purpose, since the discovery of the efficacy of blisters, in arresting the progress of mortification. It is often necessary to support the strength of the patient, and this is best done by a combination of bark and Camphor. In intermittents the same combination will be found very useful, given during the intermission, and before the expected paroxysm.

In Fevers of the eruptive kind it has long been celebrated to promote the eruption, and to bring it back if it had receded,—and in the confluent small pox it is used to promote the filling of the pustules, and to change the type of the Fever.

In Inflammatory Fevers after action has been reduced, Camphor in combination with nitre and tartar emetic is held in much repute to excite perspiration and change the action of the disease. Of this combination I have already spoken under the head of Diaphoretics.

In Chronic disorders it is used more freely and with less danger,

in some cases a little opium is joined, which prevents the uneasiness which Camphor of itself is apt to produce, and at the same time increases its operation by the skin—a mixture of Camphor and opium being one of the most powerful sudorifics. In chronic rheumatism or other disorders where copious perspiration is required, there are few medicines so certain as a mixture of Camphor and nitrate of potash, about 5 grs. of the former, and from 10 to 15 grs. of the latter, to which  $\frac{1}{2}$  a gr. of opium may be added, and the dose repeated every 2 or 3 hours.

In Dysmenorrhæa, or painful menstruation, nothing has been found to afford more relief than large doses of Camphor in conjunction with opium, and of the benefit afforded I can speak from experience, having seen it operate in many cases almost instantaneously. The proportion used is ij. to iv. grs. of Camphor and i. gr. of opium, made into a pill, and repeated every 3 hours until relief is obtained.

In the treatment of Spasmodic and Convulsive affections, Camphor has been much celebrated, but is now little resorted to.

In Mania, Camphor has been a favorite remedy, but I suspect that it has been too indiscriminately used. It ought of course to be avoided in the inflammatory forms, until action has been reduced, by vs., and other means of depletion, when the employment of it with opium, will be found useful in allaying irritation, and procuring sleep. There is however, says Dr. Chapman, a form of mania in which we can at once resort to it without premising any depletion. It is in those cases in which mania is simply an affection of the mind, the system not sympathising at all, as when it is brought on by grief, or religious melancholy. Here Camphor, and opium, with blisters to the extremities, and the alternate use of the warm and cold bath form the best mode of treatment—the patient is to be taken from the warm bath and plunged immediately into the cold, in order to give a sufficient shock.

It is, however, more especially in that *species of mania* which arises in *intemperate and debauched habits*, that Camphor exhibits its best effects. Where the system is too much reduced by long habits of indulgence in ardent spirits, to support blood letting, emetics, or the cold bath, this article will be found beneficial. Given in doses of 5 or 8 grains every hour, with laudanum, it will subdue the distressing hallucinations of the patient, renew the sensorial functions, and excite sleep. The formula which I have commonly employed is that already recommended—the quantity of laudanum being increased.

Camphor is often a useful addition to opium. Persons who cannot procure rest except from large doses of opium, will sometimes succeed by combining small doses with Camphor.

Camphor dissolved in spirits of turpentine, in the proportion of  $\text{ʒii.}$  of the former to  $\text{ʒi.}$  of the latter, is a good application for the tooth ache.

In Chilblains the Tincture of Camphor is generally considered a useful article, so much so, that many practitioners would think it heretical to employ any other remedy.

Such are the principal diseases in which Camphor exhibits good effects;—many others are enumerated by writers on the M. M., but its efficacy in them is very doubtful.

*Solubility of Camphor in Water.*—Jahn says that an ounce of boiling water dissolves a grain, and cold water half a grain. It gives to water when properly *tritured*, its odor and its pungency. Its solubility is very much increased by the addition of carbonic acid gas.—*Sigmond.*

*Of the external application of Camphor.*—Few articles are more extensively employed in this form in domestic practice. It is literally the family panacea, and the bottle containing the camphorated brandy, is resorted to with much faith and confidence in its utility. It is certainly an excellent article in all local pains, and bruises, and is much employed by physicians, as an ingredient in liniments, &c.

Camphor is given internally in various forms.

1st. In substance in the form of pill, but this is objectionable on account of its bulk, and it is more apt to nauseate than in other forms.

2nd. It is given in the form of mixture, by rubbing the Camphor with sugar, almonds or thick mucilage, and pouring water by degrees. The operation is much assisted by previously adding a few drops of spirits of wine, or other spirit, by which the Camphor is dissolved—or it may be suspended in milk, and this last mode of exhibiting it, seems to be generally preferred. The Camphorated mixture of which I have spoken, is as neat a preparation as any, and will serve for most purposes where this article is required.

There is a preparation of Camphor which from its excellence deserves to be mentioned. A solution of Camphor in water, saturated with carbonic acid gas. It is prepared in the following manner. If pulverized Camphor is diffused in water, in a Nooths apparatus, or any similar contrivance, and carbonic acid gas extricated by pouring sulphuric acid upon chalk, the water will take up a considerable quantity of this gas, which also dissolves a portion of the Camphor. This is a very pleasant preparation of Camphor, often of singular use in spasmodic irritability of the stomach, and in incipient vomiting.

*The dose of Camphor.*—Five grains of Camphor every 2 or 3 hours is an ordinary dose—it has been given in doses from 20 to 30 grs.



## OIL OF TURPENTINE.

*Family Coniferæ—Oleum Terebinthinæ Rectificatum.*—This article, from the diversified indications it is capable of fulfilling, is entitled to a conspicuous station in the M. M.

From the different species of Pine there exudes spontaneously a resinous juice, and by making incisions in the trunk of the tree it is collected in considerable abundance. Its appearance is known to all of you.

The oil in general use is obtained from the resinous juice of the *Pinus Palustris* of the Southern States, by distillation, a little water being added to prevent the temperature from rising too high. In this manner is afforded a large quantity of an essential oil which is volatile and inflammable. The residuum is known by the common name Rosin.

The Oil or Spirits of Turpentine taken into the system is an active and diffusible stimulus, occasioning a sense of warmth in the stomach, and commonly throughout the body. It has of late been introduced very extensively in the practice of medicine, and from the success which has followed its use in many distressing and dangerous complaints, it is entitled to your attentive consideration.

Of the diseases in which it has been employed, the first in importance and fatality is Puerperal fever.

Few diseases have been more destructive in their attacks and more distressing in their consequences than the present. For several years it has raged with considerable violence in many parts of England, and such was its malignity, that very few of those attacked by it escaped. Though not always so destructive in its progress, yet under the most approved modes of treatment, grounded upon the indications of the system, and directed by men of the best practical judgment and experience, the mortality was still very considerable.

Such was the state of medical science with respect to this disease, when Dr. Brennan's publication appeared, recommending the Oil of Turpentine in Puerperal fever. The effect of its application has been to arrest its destructive progress, and in some instances to restore the patient under the most unpromising circumstances.

Puerperal fever, notwithstanding the difference of opinion which exists about its nature, has its origin in irritation of the uterus, which spreads more or less to the cavity of the abdomen. So long as the organ of the uterus only is attacked, the disease is purely of an inflammatory character, and ought to be treated accordingly. But when it spreads to the peritoneum lining the abdominal viscera, symptoms of great depression occur, and a new

set of symptoms are presented. These are tension of the abdomen, with great sensibility to the touch, a pulse quick and small, though tense and corded—anxiety and nausea. Towards the decline of the disease, violent vomiting of a dark, thin matter, resembling coffee grounds, takes place, with a tremulous pulse, low delirium and a peculiarly haggard aspect. It is when these symptoms occur, denoting the extension of the disease to the peritoneum, that the Spirits of Turpentine exhibits invaluable effects. Given in doses of from  $\text{ʒii.}$  to  $\text{ʒss.}$  with an equal quantity of castor oil, it produces very copious discharges from the bowels, and with them a relief to all the distressing symptoms I have mentioned. Upon the authority of many practitioners in Europe and this country, it is stated, that when judiciously administered, it is more generally suitable, and more effectually remedial, than any other medicine yet proposed. Under its influence it is declared that women have recovered from almost hopeless conditions, certainly after every hope of recovery under ordinary treatment had been relinquished.

—*Douglas on P. F.*

Peritoneal inflammation is confessedly at all times difficult of cure—vs. is of no service, and is often dangerous, except at the very commencement. Blisters afford but temporary relief, and emetics with a variety of other means have been tried in vain. Some medicine is required in this situation, which while it supports the strength of the patient, will excite a copious secretion from the whole internal membrane of the intestines, and thus determine morbid irritation from the peritoneum. Such a medicine we possess in the Oil of Turpentine, which while acting upon the principle of a counter-irritant, determines fluids into the intestines, and by its purgative operation these increased secretions are carried out of the system. To this may be added what may be termed a specific property in itself, by virtue of which it operates as an antidote to the morbid action which exists—in the same manner as it allays the heat, burning, pain, &c. of those ulcerations produced by scalds and burns.

From what has been said, you will perceive that I have recommended the Oil of Turpentine in that stage of the Fever when typhoid symptoms are manifesting themselves—by others, however, its employment is advised in the very commencement, and during the existence of the inflammatory symptoms. The practice may be correct in both instances, allowance being made for the difference of situation in which the disease occurs. In hospitals generally, it will be found to run through the inflammatory stage so rapidly, that the disease will appear to partake of the typhus character from the very commencement. Here then it should be had recourse to early. Where, however, it occurs at large in towns and situations in the country, its symptoms partake

rather of the synochal character, and require for their subjugation the previous employment of the antiphlogistic treatment.

Its external application should also be employed, as by its irritation on the skin, it will be found to relieve many of the urgent symptoms of this disease.

In Epilepsy this medicine has acquired no inconsiderable reputation. It was brought first into notice in this city by the late Dr. McBride, whose confidence in its efficacy was confirmed by its use. As well as I am informed, his success in several instances was extremely satisfactory, and his experience such as to entitle it to be regarded a very valuable remedy in these cases. Experiments have been made with it by Dr. Percival of the Dublin hospital, and three cases are related by him in which this article was efficacious.—*Edinburgh Med. Journ.*, Vol. IX.

By Dr. Money similar experiments have been instituted, and with great advantage.

I might multiply authorities and cases, but they would be only a repetition of what has been already stated. The doses for the treatment of this disease should not exceed  $\mathfrak{z}\mathfrak{i}$ . or  $\mathfrak{z}\mathfrak{i}\mathfrak{i}$ .—2, 3 or 4 times a day—and thus administered, cures have been accomplished in adults laboring for 2 years under Epileptic convulsions.

As an Anthelmintic I have already spoken of this article, and to fulfil this indication it may be given to a large extent, the patient fasting. Its beneficial effects are not confined to the tape-worm, as I remarked to you, but all the species have been alike expelled.

In Chronic Rheumatism much benefit has been derived from the use of this article. Its efficacy has been highly recommended by Dr. Cheyne, in doses of  $\mathfrak{z}\mathfrak{s}\mathfrak{s}$ . to  $\mathfrak{z}\mathfrak{i}$ ., and even in smaller doses.

In obstinate obstructions of the Bowels it has been extolled by several. Dr. Kinglake gives an account of two cases in which the Turpentine manifested decidedly beneficial powers. The first case was one of extreme obstinacy. Bleeding, the warm bath, blistering, lenient and brisk cathartics, with repeated glysters were assiduously, but unavailingly employed. The case appeared almost hopeless when the Spirits of Turpentine was administered in doses of  $\mathfrak{z}\mathfrak{i}\mathfrak{i}$ . conjoined with  $\mathfrak{z}\mathfrak{s}\mathfrak{s}$ . of castor oil every 2 hours. The first and subsequent doses to the number of four remained upon the stomach, when full and complete catharsis was induced.—*Eberle*.

In that very irritable state of the stomach attendant upon the black vomit in Yellow Fever, the Turpentine has been recommended and employed. The discovery that in this disease there exists a peculiar kind of inflammation, and this probably of the Erysipelatous nature, suggested the application of an article which by exerting a specific operation, was calculated to overcome, or subdue this fatal action of the blood vessels of the stomach.

In some instances it seemed to afford relief, while in others it



has been rejected, and appeared to aggravate rather than allay the symptoms. I would not recommend it in this affection.

In certain Chronic affections of the chest, unattended with Fever, but when pain is referred to one spot with a general uneasiness of the respiratory system, a slight hacking cough, oppression, and a sense of weight about the precordia, and these symptoms occurring in a constitution of the phlegmatic temperament, Turpentine given in small doses will often be found productive of immediate relief, and a speedy removal of these distressing symptoms.

Turpentine is often employed for the cure of Gleet and Fluor Albus. In slight cases of the former it has been found useful. This much has been ascertained respecting this article, that when Terebinthinate or Balsamic medicines are of service, they are immediately so—therefore, if upon trial they are not found to lessen or totally remove the Gleet in five or six days, we need not continue them longer. Even where they have either lessened or totally removed the Gleet in that time, it will often recur upon leaving them off. They should, therefore, be continued for sometime after the symptoms have disappeared.

In Fluor Albus the Terebinthinate medicines have been much employed, and sometimes with success. One objection to their use is, that few female stomachs can be made to bear the quantities which are necessary. In both of these diseases it is a popular remedy and much resorted to. It is administered in the following manner.

Gum Terebinthinæ, ʒi.

Pulv. Glycir, q. s. ft. Pil. xxx.

Three pills to be taken every 3 or 4 hours.

Various other diseases may be enumerated in which the beneficial effects of Turpentine are exhibited, but they are to be found in most of the authors who treat of this subject. I shall, therefore, only detain you with the form in which this medicine is best exhibited.

The best mode of taking it, is mixed with any aromatic water, or blended with mucilage or honey. Another mode is to dissolve the Terebinthina vulgaris in whiskey or brandy, and of this from ʒii. to ʒss. may be taken diluted with water.

As the dose of this article varies according to the disease, I shall briefly recapitulate on this head.

In small doses as ʒi. or less taken repeatedly in the day, it is used in removing chronic pains of the limbs, chest, or elsewhere.

In doses of ʒi., to ʒii., or ʒiii., repeated according to circumstances, it has been used in adults laboring under Epileptic convulsions, Puerperal Fever, obstructions of the bowels, and in the irritable stomach which attends in Yellow Fever.

As a Vermifuge it is given in doses of  $\frac{z}{i}$ .,  $\frac{z}{ii}$ ., to  $\frac{z}{iii}$ .—in cases of Tænia, and in smaller quantities in the other species of worms combined with castor oil.

The next Stimulus that I shall speak of is,

#### ALCOHOL AND ITS COMBINATIONS.

Alcohol is the product of the Saccharine principle, and is formed by the successive processes of vinous fermentation, and distillation. It is presented to us variously combined according to the substances from which it is obtained, and of different degrees of strength. It is the same substance in rum, brandy, gin, whiskey, in wines, and in the number of intoxicating beverages which the ingenuity of man has discovered in every section throughout the globe.

Its flavor, however, is modified according to the substance from which it is obtained, and its strength is influenced by a variety of circumstances which will be detailed to you from another chair. From all these different liquors, the Spirit of Wine can be obtained perfectly free and concentrated by repeated distillations. When thus obtained, it is colorless and transparent, its odor is fragrant, and its taste highly pungent; in its specific gravity it is lighter than water, and this will be in proportion to its degree of concentration.

Its effects upon the system are those of a powerful and highly diffusible stimulus, increasing the activity of the circulation, exciting muscular energy, and great exhilaration of spirits. Given to a large extent, these effects are followed by intoxication, temporary delirium and stupor, exhibiting a strong analogy to the Narcotics, a class of medicines soon to be described. In this state of concentration, Alcohol is seldom used internally, for though it might be employed to rouse the powers of the system, it could seldom be used advantageously to repress irregular action, to graduate the excitement, to diminish irritation or to induce sleep. It is, therefore, principally employed as an external application to burns, to certain states of local inflammation not connected with increased action, to restrain hæmorrhages, and for the relief of muscular pains. In the states of dilution in which it exists in spirits, and in wines particularly, it becomes extensively useful in diseases, being more agreeably exciting, more cordial and pleasant to the stomach than any other stimulating article there is employed in medicine. In the *state of Wine* the Stimulant operation of Alcohol is less sudden and more permanent, it excites action without exhausting the excitability in any great degree, and from its gradual operation may be considered in comparison with ardent spirits as exerting a tonic effect. To these may be added the

nutritious substances which exist in Wine, by which the system is invigorated and supported. The diseases, therefore, in which Wine is applicable may be readily supposed to be of the typhoid nature, where the indication is to support the strength of the patient, and to obviate symptoms of debility. It is in these cases that it acts not only as a Stimulant, but by inducing a more healthy action in the blood vessels of the brain, it removes the unpleasant symptoms which so often attends in these cases, as delirium, subsultus tendinum, restlessness, &c. By the agreeable sensation it gives to the stomach, it is not only refreshing, but it communicates tone to the bowels, and excites a desire for nourishment. Gently assisting therefore, and cherishing the languid powers, it promotes all the natural evacuations, without increasing the disease, and by quickening the languid circulation, prevents those congestions from taking place in various parts of the system, which aggravate the original affection. For the production of these effects, it must be given frequently and with great freedom, and, therefore, we may say with safety, that in all severe cases, Wine is the article to be chiefly depended upon. By this practice being perseveringly employed, we may with confidence declare that many have been preserved from malignant diseases by the proper use of Wine alone.

But in advocating the use of Wine in the low stages of Fever, I would also caution against the abuse of it. There are circumstances in the constitution of the patient or the disease which plainly forbid its use. In advising it, therefore, its effects are to be duly considered. If it does not give uneasiness to the stomach, nor increase the fever, restlessness, and raving, if the sick are refreshed, composed, and inclined to sleep by it, have greater freedom from their sickness, or are better supported under it, the conclusion is that it must be a safe and suitable remedy, and without fear we may direct its use in such quantity, time and manner as the disease seems to require, and the sick can bear. If it produces effects the contrary to these, we may safely conclude that it is injurious, and that it ought to be abstained from or given in moderate quantities. Thus carefully exhibited, Wine will be found, says Dr. Chapman, not the least important of the Stimuli at a proper period in these diseases, being readily taken, even when other medicines are rejected, and with unrivalled effect it sustains in many instances the exhausted powers of life.\*

Few remedies have been more abused than Wine in Fevers.

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\*In whatever disease you may administer Wine or the Alcoholic fluid generally, you should always be careful as to the state of the skin. If it be hot and dry, you must not attempt to give it, but when the heat is about the natural standard, that is about 98°, you may almost invariably give it with safety, and if the nature of the disorder really demands it, with advantage.—*Tweedie*.



It is still given by many practitioners of the present day in every stage and complication with too free a hand, without a proper consideration of the organic derangements which often forbid its use. There are circumstances, however, in *Febrile* cases which render it indispensable to save the life of the patient. It is demanded in cases commencing with such excitement as to render the use of depletives essential, when in their course some unexpected symptoms of sinking of the vital powers, or a sudden collapse come on, which render the use of Wine, Brandy and Ammonia necessary. Such cases are not unfrequent, not only in Typhus Fevers properly so called, but even in some of the more acute affections—Bilious Fevers, and Intermittents of a malignant character. During the summer of 1831 several patients were admitted into the hospital, who trading to Savannah were detained in the river several days, and others of the crew of the Revenue Cutter, were attacked with Fever of the climate, and of a very violent character. After the 3d or 4th paroxysm, great prostration ensued, with congestion, and such feebleness in the vital powers, that reaction seemed as if it could never be excited. Several of these patients were only restored by the free use of Stimulants. Again, the practice becomes useful in persons *above the middle age*, who *have lived intemperately*, and in whom these sudden changes are very likely to occur. The practitioner should be much on his guard in acute cases of Fever, and he will have reason to congratulate himself who can provide for these emergencies, but he will be doubly happy who by much care can foresee and prevent them.

Stimulants become necessary in the advanced stages of Typhus Fever, when the symptoms indicate a failure of the nervous and circulating systems, and especially when evacuations have in the beginning been judiciously employed. Here the administration of Wine often acts as a charm, by rousing the languid powers and abating the restlessness.

The quantity of Wine which should be administered in Typhus, must of course depend upon the symptoms, and the degree of action existing in the system. Sir John Pringle was in the habit of ordering in the jail or hospital Fever from a quarter to half a pint a day of the strong kinds of Wine, (which quantity would now be deemed insufficient in many cases,) and of Rhenish, or small French Wine, as much as a quart a day. In low or nervous Fevers, Dr. Gilchrist allowed a bottle a day, and Dr. Heysham gave as much as two bottles and a half in the space of 24 hours in the Putrid Fever which appeared at Carlisle in 1781, and thinks that even more might sometimes be given with advantage. In the last stage of the jail Fever, Dr. C. Smyth has given with advantage two bottles of Madeira a day for several days together.

Upon the subject of quantity no precise directions can be given. In some of the above instances it may have been given in too large quantities, and in others not sufficient. The strength may certainly be roused by powerful Stimuli, used to a great degree; but it may be questioned whether the patient has been benefitted, since I have seen this new excitement immediately followed by an inflammatory condition of the brain, or the excitability so much worn out, that no subsequent attempts could renew the powers of life. Perhaps a pint a day may be generally sufficient.

The *choice of Wine* is not a matter of indifference. To obtain the medicinal effects of Wine a preference is commonly given to Port, as being less disposed to acidity, and possessing a less degree of Spirit than Madeira. When this cannot be obtained, good old Madeira will be found to possess every quality which is necessary to excite action, and to supply the pabulum upon which this action is to be maintained. Next to these is Sherry. As a general rule it will be found advisable to allow the sick their favorite Wine.

When Wine cannot be procured, Cider, Porter, or Spirits diluted with Water, sweetened and acidulated, are tolerable substitutes. Dr. Cullen was of opinion that the last mentioned compound and Opium produced all the effects of Wine, but Opium does not appear to support the pulse like Wine.

Of the use of Ardent Spirits in diseases I need not say much. They are seldom resorted to except in extreme cases, and it is such cases only as will justify their use. Their Stimulant operation is not sufficiently permanent or capable of being regulated, and it is questionable whether the patients may not suffer more from the depression which follows the excitement they produce, than he can be benefitted by the temporary elevation consequent on their use.

#### OF THE POISONOUS OPERATION OF ARDENT SPIRITS.

It is not often that we have an opportunity of witnessing the immediate poisonous operation of this article—but it does sometimes occur. The symptoms and treatment will be best illustrated by a case.

A little girl about 8 years of age, brought up in the house of a courtesan, of much intelligence, forward manners, and ready, from neglect of moral culture, to participate as far as her age would allow, in the scenes acted in her presence, had early contracted a fondness for Spirits. One evening, when alone, she poured out a tumblerful of Brandy, and, as far as could be ascertained, swallowed one half nearly. In a short time symptoms of intoxication ensued, and from the lifeless state of the child, alarm was excited, and assistance sent for. Upon visiting her, the following symp-

toms presented themselves:—Insensibility, apoplectic stertor, labored and imperfect respiration, weak and frequent pulse, with paralysis or insensibility on the iris. Upon learning the cause of these symptoms, an emetic in a large dose was exhibited, but without being followed with any operation. Several were tried, warm water poured into the throat, and as much as possible introduced into the stomach—the fauces were irritated with a feather, but all to no purpose. Cold affusion was practised, and various attempts made by agitating the body to rouse the patient, but all with no effect.\*

Finding that the stomach could not be excited by any of the usual means, and fearing the consequences if left in this situation, with the assistance of a friend, the stomach pump was put into operation, and with the effect of evacuating the contents of the stomach. By this time the patient seemed much exhausted, and before the tube was well withdrawn, the vital spark had fled.

The degree of danger arising from Ardent Spirits, will be estimated by the inirritability of the iris, and the want of energy in the stomach to expel its contents. If this last can be exerted, the patient will recover; but if it cannot, death is usually the consequence, since it is to be presumed that the stimulus has been so powerful as to bring on a fatal state of collapse, by which the powers of vitality are exhausted—and instances are not rare, of persons having fallen dead instantaneously, upon swallowing a large quantity of spirits.

*Morbid appearances* have been engorgement of the vessels of the brain, and a quantity of serum in the lateral ventricles.

#### CAPSICUM ANNUUM—RED PEPPER.

*Family Solanaceæ.*—The next of which I shall treat, is the Capsicum Annuum—Vel. Piper Indicum or Red Pepper.

This plant is a native of South-America, but is cultivated extensively in the West-Indies and in this country. The fruit which it bears is an oblong pod which is long and pendulous, being at first of a green color, and afterwards of a bright red.

Its odor is aromatic and penetrating, and its taste hot and acrid—the sensation it excites remaining long impressed upon the palate.

*Chemical History.*—From this article a peculiar substance has been obtained, which has been called Capsicin, by Dr. Conwell.

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\* In these cases, ammonia should be tried, either in the form of aq. ammonia diluted with water—or the acetate of ammonia, from *3ii.* to *3iv.* frequently repeated. This has been said to exert almost a specific effect upon the habit, and prevent those uncomfortable feelings which invariably accompany the transition from drunkenness to sobriety.—*Thompson, M. M.*



When perfectly pure it is tasteless, inodorous, and crystallizes in acicular fragments. It is neither acid nor alkaline—oils, alcohol and æther dissolve it.

*Ætherial Oil of Capsicum.*—This Oil possesses a most intolerable warmth and acrimony of taste, and concentrates all the Stimulant properties of the pod. It is of a brilliant reddish color, has a peculiar odor and aromatic taste. It is obtained by digesting Capsicum pods in Sulphuric Æther—filtering the tincture and leaving it to a spontaneous evaporation. As the Æther falls, crops of Crystals of Capsicin will be seen round the inside of the vessel, and after all the Æther is dissipated, the warm aromatic or concentrated Oil of Capsicum will be found at the bottom.

Capsicum is a very active Stimulus, differing in a very essential manner from the preceding article, in not exerting any operation upon the brain, or in not being possessed of any Narcotic properties. It is principally employed as a condiment, in which respect it is highly esteemed by the inhabitants of warm countries, being much resorted to for the purpose of promoting digestion, and giving energy to the Alimentary canal. In this respect, it is said to produce less harm than any other Stimulating article of the same description.

In a medicinal point of view, it has been applied to several diseases, in which its powers have been much celebrated.

In Yellow Fever the employment of this article has met with many advocates. It has been recommended for the purpose of supporting the strength of the patient, and in that dangerous state of the disease when the black vomit has come on. It is to be continued until a generous warmth takes place, which must be kept up as long as the debility or the vomiting continue. Its operation upon the stomach during the existence of the black vomit, may be considered as that of counteracting, by its Stimulus, the morbid actions which the miasma has engendered, or inducing a different action in the stomach, and first passages, from that of the disease. But I have never seen any benefit from the use of this article, or the Spirits of Turpentine, in this disease.

In certain stages of Dyspepsia, Capsicum has been recommended. As a Carminative in expelling wind, or in allaying pain arising from the irregular action of the muscular coat of the stomach, or in assisting digestion, and removing an unpleasant sense of coldness which distresses a weakened stomach, this article in doses of a few grs. will be found very useful.

In Cynanche Maligna, Capsicum taken internally and used as a local application, has been highly commended by the West-India writers. The manner in which it is directed to be used, is the following.

Two tablespoonsful of Cayenne Pepper and two teaspoonsful

of Salt are to be beat up into a Paste, on which half a pint of boiling water is to be poured and strained off when cold—an equal quantity of very sharp Vinegar being added to this infusion, a tablespoonful every half hour is a proper dose for an adult. It is also used as a gargle in the same affections, and this preparation is considered well adapted to arrest the progress of gangrene and sphacelus in the throat.

A teaspoonful of powdered Pepper, or a single Pepper to a pint of warm water is also used in cases of relaxation of the muscles of the throat and Uvula, with very pleasant effects.

Dr. Daniel, of Savannah, has spoken of this article in very high terms in Febrile diseases, for its Stimulant and diaphoretic properties. In his treatise on Fevers, the practice is particularly detailed, and as it is well written, and contains useful principles, should be read by you.

The dose of Capsicum is from 2 grs. to 10—and it may be given in the form of pills or tincture.

Some individuals troubled with cold feet have derived benefit from wearing socks dusted with Cayenne Pepper.

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*Family Piperinæ.*—*Piper Nigrum* or Black Pepper. The tree which furnishes the seed, or berry, grows spontaneously in the East-Indies, but does not arrive at perfection without the aid of culture. It is cultivated with such success in Malacca, Java, and especially at Sumatra, that from these Islands Pepper is exported to every part of the world, where a regular commerce has been established. This article may be considered as Stimulant and Carminative. Its use as a condiment is well known, and although in general it is not hurtful, but rather useful to those who have a weak digestion, yet even in small quantities it proves injurious in inflammatory habits, and to those subject to hæmorrhoids. As a medicine it is found serviceable sometimes in checking nausea and vomiting, and removing hiccough. It is also used in retrocedent Gout, and a watery infusion forms a useful gargle in relaxation of the Uvula.

Such are the more usual applications of this substance—and for these it would hardly require notice, but of late it has been extended to the treatment of Intermittent Fevers, and under circumstances which would render it on occasions, a desirable article.

In Europe, Pepper is used to a considerable extent in Intermittent Fevers, either in the state of powder, or the seeds swallowed whole, to the extent of five to eight twice a day. The seeds are dipped into a solution of Gum Arabic, and afterwards in powdered Columbo to disguise them. The reports of its efficacy in the varieties of Intermittent Fever are very favorable, it being stated that in no case was it necessary to give more than 70 or 80 of

these pills before a cure was effected, and that relapses rarely occurred. From it, a peculiar crystalline, colorless substance has been obtained, to which the term Piperine has been given, and which on all occasions deserves a preference. It is employed in doses of from one to four grs., and its use has been attended with as much success as the Quinine. It will be found a valuable adjunct to that substance, equal parts of each acting with more energy and success than Quinine alone. Half a grain of Piperine, and  $\frac{1}{2}$  gr. of Quinine, act with more effect than ij. grs. of Quinine alone.

From Pepper has also been procured an Oil called the *Oil of Black Pepper*. It is also found useful in Fevers of a Typhoid character, and as an adjunct to Quinine in Intermittents. It is a much more active preparation than Quinine, one drop being equal to iij. grs. of that article. It is recommended as a cheaper and more valuable addition to Quinine than Piperine.

The results of various experiments are,

1. That Pepper seldom disturbs the stomach and bowels.
2. That it acts upon the bowels producing a regular alvine discharge. Alcohol and æther are the menstrua by which this article is separated. The process being tedious, I shall refer you to Dr. Carpenter's observations in the American Journal of Medical Sciences, and for other details of this article.

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The last of the Stimulants of much medicinal value is the

*Piper Cubeba* or *Cubebs*.—This plant is a native of the East-Indies, and of Sierra Leone. The fruit resembles the common Black Pepper in size, is of a greyish color, and has commonly a little footstalk attached to it, from which it is sometimes called Tailed Pepper. It is less pungent than Black Pepper.

It is principally known as a remedy in Gonorrhœa, in which disease it has acquired considerable celebrity. Of late its importance has been much questioned, and the subject has been considered by Dr. Broughton in an interesting paper in the *Medico-Chirurgical Trans.*, in which the results of its exhibition in 50 cases of Gonorrhœa are detailed. Among 50 cases treated with Cubebs, there were 3 total failures—5 relieved—and one relapsed—leaving 41 cases cured under the use of the Pepper in less than a month with one exception—the largest proportion in less time than 5 weeks, and several in a few days, among which latter some were well in 48 and 36 hours—and the failures excepted, the relief in all cases where the symptoms were urgent, was very sudden.

Over the Balsam of Copaiva it seems to hold advantages, in being admissible in the earliest and worst stages of the severest Gonorrhœa, without being productive of inconvenience to the patient, while it has not been found that its continuance was attended with that injury to the functions of the stomach which so fre-



quently arises from full and continued doses of Copaiva. The time in which these cures were made, may be considered as giving this remedy some claims to a superiority, and when it is considered that it is perfectly safe, it is surely entitled to a trial.

The dose of Cubebs is from  $\mathfrak{zss.}$  to  $\mathfrak{zii.}$  repeated twice or thrice a day, and best administered in milk, or it may be given in the form of Tincture in the quantity of  $\mathfrak{zi.}$  to  $\mathfrak{zss.}$  as the powder.

Mr. Broughton directs that when it has been used for 3 or 4 days without any beneficial effects following, it should be superseded by some other remedy—and as soon as it appears to cease exerting its influence on the constitution, the Balsam may be employed advantageously.

These very favorable reports have not been realized upon further trials. I have employed it alone, without much advantage, and have been better pleased with a combination of the Tincture or powder with the Balsam, in equal proportions, after the inflammatory action has been subdued. Thus administered, it is not only more useful, but more agreeable.

The following formula has been recommended by Sir A. Cooper, in very high terms.

R. Powdered Cubebs—and Bals. Copaiva,  $\mathfrak{a} \mathfrak{zss.}$   
 Powdered Gum Arabic,  $\mathfrak{ziiii.}$   
 Cinnamon Water,  $\mathfrak{zvj.}$

One, 2 or 3 tablespoonsful 3 or 4 times a day.

When the powder is *administered* it is digested *in the stomach*, and the volatile oil entering the circulation, is carried to the kidneys, which it stimulates, thereby augmenting the quantity of urine, and imparting to it its odor. The advantages in the use of this article are due to these circumstances.—The increased secretion of urine rendering it less acrid in its composition, by which it becomes less irritating to the bladder and urethra, while the same parts are subjected to the specific impressions of the medicine.

By a recent examination of this article, Dr. Battley has found an extremely volatile oil in the proportion of  $\mathfrak{zi.}$  and  $\frac{1}{4}$  to a lb. of Cubebs. In this oil the virtue of the article resides, and hence the uncertainty which often follows its use, the medicine in many instances when administered containing this oil, while in other instances it has been dissipated. Hence to secure the effects of the Cubebs, it should be preserved in close vessels, and ground or powdered a few hours only before it is administered, so as to retain as much of the oil as possible.

Or the Oil itself may be administered in the proportion of  $\mathfrak{zss.}$  to  $\mathfrak{zi.}$  to an  $\mathfrak{zvj.}$  mixture, in the same manner as the oil of Copaiva is administered. Dose, a tablespoonful several times a day. Eight drops are equal to  $\mathfrak{zss.}$  of the powder. The discovery, therefore, of the Oil is an important one, as we have in many in-

stances a remedy for Gonorrhœa in as small a compass as we have for Ague, in Arsenic or Quinine. The dose of the Oil will be from 10 to 20 drops, 3 or 4 times a day, combined with sugar or mucilage, and will very properly be resorted to when the stomach rejects the Balsam.

Cubebs has been objected to from its tendency to produce swelling of the Testicle. After frequent trials of this article, in the form of powder, and essential oil, I have only known of one case in which this effect was satisfactorily ascertained to have been produced.

There is yet one other mode of using this article, viz. in the form of Enema.

According to the Hospital reports in France, it was so employed to the extent of  $\text{ʒvj.}$  or  $\text{ʒvjii.}$  upon 4 patients. In one case it was completely successful in a very rapid manner, though the Gonorrhœa had continued a month. In other cases the *effects were not* satisfactorily ascertained.

Bals. Copaiva has been exhibited in the same manner in a number of cases—20 or 30—in one of the French Hospitals. Five of the patients were speedily and effectually cured. The result of the whole is, that the Balsam administered in the above manner, diminishes considerably the discharge in almost all cases, and in the great majority cures the disease completely in 3, 4 or more days.

The quantity used is  $\text{ʒii.}$  of the Balsam suspended by means of the yolk of an egg in  $\text{ʒiv.}$  of bland fluid, and this given as an enema. The second day the quantity is doubled, the third day  $\text{ʒvj.}$  are exhibited, the fourth day  $\text{ʒvjii.}$  if the discharge continues rebellious. Some opium in solution is added in order to tranquilize the rectum, and enable the patient to retain the enema, which ought to be kept in an hour or two, or until it is absorbed, if possible.

Sometimes the patient experiences no particular sensation and retains the medicine without difficulty. At other times colic is produced, and the patient is unable to resist the propensity to evacuate the Rectum. Sometimes the inconvenience is only temporary and soon subsides. In very few cases was there nausea or any general disturbance. The practice has not been repeated, as far as I know, in this country, but is fully deserving of a trial.

This article has been employed in other diseased conditions of the Mucous Membrane—viz. in Leucorrhœa, and with advantage—given in similar doses, as in the former disease, it has had the effect of relieving this tedious and unpleasant affection. It has also been employed in Chronic affections of the Mucous Membrane of the Bladder.

*Adulterations.*—This article in the state of Powder is liable to

be adulterated, chiefly with other and cheaper kinds of Pepper. It is mixed with pulverised Pimento.

Cubebs when in the pulverised state ought to be kept in a well stopped phial, as its essential oil is very volatile—and when kept in paper, the latter absorbs a very large proportion of it.

Such are the articles most deserving of consideration in this class of medicines. Others might be enumerated, but I will refer you to the treatises on the M. M.

#### NARCOTICS.

The next class of medicines included under the head of Stimulants, is that termed Narcotics—Hypnotics, Anodynes.

The definition applied to this class is, such substances as diminish the sensibility and irritability of the system, without occasioning any sensible evacuation. This definition has been considered objectionable, inasmuch as with the expression of some of the properties of these medicines, their Stimulant operation is not included. I shall satisfy you, that though the Narcotics have been considered by Dr. Cullen, and other writers on this subject, sedative, that they are Stimulants endowed with considerable activity, and great diversity of remedial operation. *Their general effect* is to increase the force and frequency of the pulse, to excite the operations both of body and mind, giving to them increase of vigor, and inducing hilarity and intoxication. These symptoms after continuing for a time, are followed by those of diminished action, the pulse becomes slower, but is full and soft—the body is less sensible to impressions, the respiration is more easy, pain and inordinate motion if present are alleviated or depressed, the mind becomes inactive, and finally sinks into sleep. To these succeed debility attended with an unpleasant degree of lassitude, tremors, and oppression.

Such are the effects of a small dose. If, however, it has *been large*, these symptoms of diminished sense and action are induced without any previous excitement—and if the quantity be still larger, delirium, paralysis, coma and convulsions are superadded, and death finally succeeds.

These are the general effects of Narcotics. They are, however, considerably diversified according to the article employed, and not only do they differ widely from each other in their effects upon the system, but the operation of each is very different at different times, according to age, habit of body, dose and use, and various other circumstances.

They all agree, however, in one respect, which is their effect upon *the functions of the Brain*. This leads to the consideration of the manner in which this class of medicines operate.



The action of the Narcotics is principally directed to the Brain and Nervous system, and hence may be called Sensorial Stimuli. As the other Stimulants exhibit their effects upon the circulation primarily, and the Brain as a secondary operation, these, on the contrary, exert an influence upon the intellectual and nervous systems, exciting them to increased activity, and producing as a consequence a diminution of their sensibility and irritability. To these peculiar powers are we indebted for the beneficial effects which they display in diseases—powers which entitle them to be considered the best gifts of Heaven to his fallen creatures.

But though all of this class agree in operating upon the Brain, their effects are by no means uniform, but, on the contrary, greatly diversified. Some affect in a peculiar manner the mental powers, and proportionally little the other functions of the Brain, (as a particular mushroom and nitrous oxyde gas.) Opium has the greatest tendency to induce sleep—green tea, on the contrary, to excite watchfulness. Alcohol and its combinations, which are by some considered Narcotics, excite also the actions of the heart and arteries; others excite little or no action. Opium constipates the bowels, while the hyosciamus in allaying pain and irritation has no such operation.—*Clutterbuck*.

It is from the action of these articles upon the Brain primarily, that speedy dissolution follows the introduction of a very large dose into the stomach. This has recently been established by the experiments of Dr. Brodie, (*Philosophical Mag.* Aug. 1811.) On introducing a small quantity of the juice of aconite, or the essential oil of bitter almonds diffused in water, or of the leaves of tobacco into the rectum, or in a concentrated state into a wound, the entire loss of voluntary motion and total insensibility was produced—yet even when this state was allowed to continue until all the external signs of apparent death were present, the heart when exposed to view was found contracting with considerable force, and by inflating the lungs and keeping up artificial respiration, its action could be kept up nearly to the natural standard for a considerable period. It seems, therefore, that while the nervous system was so much affected, the powers of the circulating system were little impaired; and the cessation of the function ultimately producing death, appears in such cases to arise principally from the respiration being affected, and at length ceasing, in consequence of this function being so much dependent upon the influence of the nerves.

The immediate effects of Narcotics arise, therefore, from affecting the functions of the brain. In large doses, the function of respiration is impaired in consequence of this, and at length ceases, and this occasions, or at least accelerates the failure of the circulation, which produces death.—*Murray, M. M.*

I would refer you for some interesting experiments to Dr. Le Gallois's work.

The impression of Narcotics is upon the nerves of the stomach, whence the action is propagated by nervous communication to the Brain, and to the rest of the system. Their effects follow too rapidly, to suppose, that they have been received into the circulation, and in cases of death succeeding the introduction of a large dose into the stomach, the quantity taken has been found, on dissection, undiminished.

As the question of the Stimulant or Sedative operation of the Narcotics is of importance, not only in a practical consideration, but from the character of the individuals who have been opposed to each other on this point, it may not be amiss to state the grounds of the discussion.

By Dr. Cullen it was contended, that the operation of Narcotics extends to every function depending upon the energy of the Brain; with respect to which they show a Sedative power—which though various in degree, and variously modified, both by the different condition of the Narcotic, and by the different condition of the body to which it is applied, yet that the effects are universally and directly *Sedative*. But as a Stimulant operation often follows the administration of Narcotics, Dr. Cullen was, in consistency, obliged to give some explanation for this occurrence. He therefore supposes that their operation is unfriendly to the system, and that to obviate their ill effects, the *vis medicatrix naturæ* is excited into action to alter and correct them. In this, therefore, consists their Stimulant action. Narcotics, therefore, are, according to Dr. Cullen, directly Sedative and indirectly Stimulant.

A contrary opinion to this was maintained by Dr. Brown, who considered Narcotics as Stimulants surpassing all others in the diffusibility of their action, and that the debility which ensued was the result of this increased action. This opinion is supported upon the known operation of these medicines. I have already spoken of them when considering their effects upon the system. They are referable to excitement, which in proportion as it is strong and diffusible, is at the same time transient in its duration, and is soon followed by symptoms of diminished action. If the dose is large the Stimulant effect is so rapid as to be hardly perceptible, and hence the Sedative, or depressing effects only appear; and in a still larger dose they produce diminution of power, and consequently of action, without any symptoms of previous excitement. The absence of those symptoms which indicate an increase of action when large doses have been taken, may be explained in the same manner as when speaking of the poisonous operation of ardent spirits. A collapse of the system takes place, from an engorgement of the vessels of the Brain. Hence then Dr. Brown

concluded that they are directly Stimulant and indirectly Sedative.

This opinion I need not inform you is the one which is most generally received, and which corresponds with the known operation of these articles on the system.

I shall state a few of the reasons which are commonly assigned for considering Narcotics Sedatives, together with a refutation of them.

1. An argument advanced in favor of the Sedative action of this class is derived from the soporific effects some of them possess, or tendency to induce sleep. But how is sleep induced? Can it not be brought on by any other than a direct Sedative operation? or rather is it not in common the effect of positive and direct Stimulating operations?

Dr. Rush, in considering the causes of sleep, says—Natural sleep is brought on by a diminution of the excitement and excitability, by the continual application of Stimuli, which act upon the body in its waking state. He then goes on to state that sleep may be brought on at an earlier hour by an increase of the force of these Stimuli, as a long ride or walk, unusual exercise of the understanding, the action of strong passions or emotions, &c. Artificial sleep, he then adds, may be induced at any time by certain Stimulating substances, as opium, &c. Opium in the production of sleep operates in the same manner as the natural Stimuli above mentioned. They all wear out the excitability, and bring on that state of indirect debility which is followed by sleep. If these medicines were directly Sedative, they would bring on sleep at all times, and under all circumstances, and the sooner and more perfect, the stronger they are or greater the quantity. Instead of this, if you give a man ready to drop asleep from fatigue and watching, a dose of any soporific medicine, it will put off sleep for sometime. Here then the Stimulus of the Narcotic medicine seems to have the effect of putting off sleep as long as the excitability or sensibility of the body is sufficient to support their effects.

2. A second reason for supposing these medicines Sedatives, is derived from their power of relieving pain.

Dr. Moore in his treatise on the M. M. in explanation of this operation of Narcotics, says, that it seems evident that Narcotics act by exciting a *strong affection in the Brain*, and not by rendering it torpid and insensible. That the first impression is an excitement in the Brain, is proven by the exhilaration which is generally seen upon swallowing the medicines, by the increase of the action of the heart and blood vessels, and that their beneficial effects seem to depend upon their producing an excitement in the Brain different from that which is occasioned by the painful impression, and thus relief is obtained. That it is not by any Sedative operation we know, from the Narcotics exciting pain and inflammation



when applied to any tender part, as the globe of the eye or the surface of a wound. We know too that these medicines are contra indicated in diseases where pain is a consequence of high action, and are only employed after the activity of the circulation has been reduced. If they exerted any Sedative operation, why are they not attended in such cases with the same feelings of relief which follows bloodletting when properly and judiciously prescribed? The most satisfactory explanation of their operation is established upon the Stimulating effect of these substances.

3. A third proof of the Stimulating operation of these medicines is derived from their exhilarating and producing intoxication. I have already spoken of the use of opium in Eastern countries where wine and liquors are forbid, for the production of these effects—and that it is often had recourse to, to induce mirth, to dispel melancholy, and to relieve the mind of its troubles and disappointments.

With the views I have given you of the effects and operations of Narcotics, they evidently become in practice remedies of great importance. The proper administration of them in disease, is however a matter of no small difficulty, and calls for much, both of experience and discrimination, on the part of the practitioner. Nothing in the practice of our profession being more difficult, than to fix the period in the progress of a disease, or to ascertain the circumstances in which it becomes proper to prescribe Stimulants.—*Chapman.*

They may be so employed as to produce a Stimulant impression, or a state of depression may be occasioned without any previous excitement being apparent. To obtain the Stimulant effects, they must be given in small doses, frequently repeated, as thus the excitement they produce is kept up and sustained. When the design is to mitigate pain, to procure sleep, to relieve irritation, to deaden sensibility, they should be given in full doses and at distant intervals.

Rules in the administration of Narcotics—furnished from Chapman's Therapeutics:

1. We should begin with small doses, in order to test their action upon the system. These may soon be increased, as there is no class of medicines to which the system becomes sooner habituated, or which lose their effect more quickly by repetition, than the present.

2. It is wrong to combine many of these articles in one prescription, or to use any number of them at one time. The importance of this rule will be obvious from the preceding observations. The system becoming habituated to one Stimulus, we renew the first impression by changing it for another, and in this manner keep in our employment a corps of reserve.

3. It is proper to change the part of the body to which we apply Stimulants, as sensibility will be left in one place to a remedy when completely exhausted in another. The stomach becoming enfeebled, we can have recourse to the skin, and from this last to the rectum—it being observed that impressions may be excited in the system by applications to this part of the Alimentary canal, when their operation has in a great measure ceased elsewhere.

4. The fourth rule in the employment of Stimuli, is to endeavor to graduate the strength of the Stimulus to the state of excitability. This is a rule of much importance in practice, and from attention to which very happy results will often be obtained. In all cases of disease the strength of the Stimulant should be proportioned to the excitability of the system, as without it, premature depression will be produced and the system be exhausted by the very means which should have preserved it.

#### PARTICULAR NARCOTICS—OPIUM.

At the head of these must be placed Opium, whether we consider the extent of its powers, or the strong Narcotic operation which it exhibits. It is the product of the *Papaver Somniferum* of Linnæus, a plant growing in great abundance in Egypt, Turkey, and the different provinces of Asia. It flourishes particularly well about Thebes in Egypt, whence it is called Thebaic Opium.

The plant grows to the height of four feet; its petals are very white, and the pods become full in the month of June. At the time the pods become nearly ripe, incisions are made into them in the evening, and from them there oozes out a considerable quantity of a milky fluid. This fluid is scraped off early the next morning from the wounds with an iron scoop, and worked in an earthen pot for a long time in the sun, until it becomes of a considerable consistence. This is then made into lumps of a globular form, which are covered with the leaves of the poppy or other vegetable, to prevent their running or sticking together.

The operation of making incisions into the capsules is repeated three times, but the produce gradually decreases in quantity, nor is it of so good a quality. The kind most esteemed is rather soft and yields to the touch, is inflammable, of a blackish brown color, and has a strong fetid smell.

There are four kinds of Opium to be met with in commerce—the Turkey, the East-India, the Egyptian and the European Opium.

The former is a compact substance, possessing a considerable degree of tenacity. When broken, it has a shining fracture and uniform appearance—of a dark brown color, and becoming yellow when reduced to powder. Its taste is nauseous and bitter,

which soon becomes acrid with some degree of warmth, and has a peculiar heavy, disagreeable smell. It is frequently found in our markets mixed with leaves, stalks, seeds, &c.—and from the great proportion of these admixtures, it would lead to the conjecture that the leaves were worked in when the Opium was in a soft and recent state, for the purpose of increasing its weight and consistence. The quantity of these inert substances is frequently so great that an ounce yields only from  $4\frac{1}{2}$  to 5 and 6 drams of soluble and extractive matter.

It is adulterated with various other substances—with extract of liquorice, when the specimen is brittle and tastes sweet—sometimes with gum arabic or tragacanth. It is mixed with sand and gravel, which is very common, in order to increase its weight, and the Opium feels gritty between the teeth.

2. The East-India Opium has much less consistence, is much more dark, has a taste more nauseous and less bitter, and possesses only half the power of the former. Of late the quality of this article has very much improved, and specimens of Bengal Opium sent to Great-Britain have been of a very superior quality.

3. Egyptian Opium closely resembles in every respect the Turkey Opium. That brought from Thebes in Upper Egypt was formerly in great esteem; thence the name *Thebaicum* is still used to imply select Opium. Of late years the Pacha has encouraged the growth of Opium in Egypt.—*Thompson, M. M.*

4. European Opium is chiefly the production of France and England. It is in small cakes, of a more permanent consistence, of a clear, smooth fracture, and destitute of leaves, stalks and other impurities. It has the general character of being purer than the Turkey, which chemical analysis has determined—and more morphia has been obtained from the former than the latter.

Opium is an article that might very well be cultivated in the Carolinas and Georgia, and that to a considerable extent. Some specimens have been made which were pure and as active as the Turkey, probably more so.

The consumption of Opium is much greater than at first we would suppose—about 40,000 pounds are annually imported into London. It might be an object worthy of the attention of medical men. It is easily raised, and it is estimated that an acre will yield 24 pounds of Opium, and 40 lbs. of seeds, from which a good deal of fixed oil is obtained.

*Chemical Analysis.*—Few articles have undergone a more careful and complete analysis than the present—and for the full and satisfactory investigation of its intimate principles, we are indebted to the researches of modern chemistry. It is to the experiments of Derosne, Serturmer, Seguin, Robiquet and others that we are



made acquainted with the principles upon which the Narcotic virtues of Opium depend, and which they have been able to separate from the other and grosser parts of Opium.

The analysis of Opium is as follows:

1. A Volatile Oil—on which the odor peculiar to good and well prepared Opium depends.

2. Gum—including Bassorine.

3. Extractive—partly simple, partly more than usually oxygenated.

4. Resin—with which the coloring matter is closely combined.

5. Caoutchouc.

6. Narceine or Narceina.

7. Meconine.

8. Morphia in combination with Meconic Acid.

9. Narcotina.

10. Sulphates of Lime and Potash.

11. A brown acid.

12. Lignine.

Upon a few of these substances I shall make some remarks. The Resin before the discovery of the Meconate of Morphine, was regarded as a very important part of Opium, and to its presence the Stimulant quality of Opium was referred. To it also was attributed its astringency, flavor and Narcotic quality.

The Meconic acid was discovered by M. Serturner, a German apothecary, in 1801, and is, in its pure state, a colorless solid, crystallizing in long needles, volatile, and soluble in water and alcohol. It is separated from Morphia by means of ammonia, magnesia, or acetate of lead. Its only apparent use is to *confer solubility on the Morphia*—it having but little medicinal action upon the system either in its pure state or in combination with various salts.

Morphia, or as it is called by the French, Morphine, was also discovered by the same chemist, though perhaps previously seen by Derosne and Seguin. It is prepared by adding to a concentrated aqueous solution of Opium, calcined magnesia. The magnesia decomposes the meconate of Morphia, and forms a meconate of magnesia—and throws down the Morphia, in conjunction with the meconate of magnesia. The precipitate is collected on a filter, and by being washed alternately with very dilute cold and hot spirit, the coloring matter is taken up in a great degree; after which, by boiling the residuc in strong alcohol and filtering, the Morphia crystallizes as the spirit cools—the meconate of magnesia remains insoluble. The per centage of Morphia to Opium is from 10 to 15 per cent.

The Morphine constitutes exclusively the Narcotic property of Opium, or that principle by which sleep is induced; and hence it has been called Morphine from Morpheus the god of sleep. It is

given in doses of the 1-6, 1-4, 1-3, 1-2 of a gr., and it possesses this advantage over Opium, that it produces all the soothing and anodyne operations of that article, without its unpleasant effects. To persons of much delicacy of habit the discovery is an important one, as in them the consequences of Opium are often so very distressing as to counterbalance the relief which may have been afforded. This preparation then furnishes a substitute by which all the beneficial effects of Opium may be obtained without any of its injuries. Morphia when pure is insoluble, and therefore almost inert—for Orfila gave 12 grs. to a dog without its being followed by any sensible effect.

When converted into a soluble salt by means of acetic acid or the sulphuric, its Narcotic properties are much more manifest. The acetate and sulphate and muriate of Morphia have been employed in France for several years past with advantage.

Narcotine is another principle peculiar to Opium. This is a substance which chrystallizes in beautiful pearly prisms, or tables, and is another elementary principle of Opium. It was supposed to be a salt of Morphia, but it is now acknowledged as a separate and distinct principle and was discovered by Derosne before the Morphia. It is prepared by evaporating an aqueous infusion of Opium to the consistence of an Extract and digesting it in sulphuric æther. This solvent, which does not act upon the meconate of Morphine, takes up all the Narcotine and deposits it in acicular crystals by evaporation. The Narcotine, or matter of Derosne, is not applicable to any remedial purpose—it is known as the principle upon which the stupefying effects of Opium depend. It is said that when given in a feeble dose, as *one gr.* dissolved in oil, it produces on dogs a state of stupor, which those little habituated to experiments may confound with sleep. It is, however, very different—the animal remaining in a dull, motionless state, its eyes open and the respiration much affected. To these symptoms death supervenes in 24 hours. Acetic acid seems to have the effect of destroying this operation of the Narcotine in a great degree, for if an acetate of Narcotine is employed 24 grs. may be administered to animals without being destroyed. From hence we may conclude the beneficial effects of lemon juice or vinegar in cases of poisoning from Opium.

Narceine, the new principle lately discovered by Pelletier, is obtained from the fluid which remains after the Morphia and Narcotina have been separated, by adding to it muriate of Baryta, so as to neutralize all the Meconic acid.

Its action upon the economy is unknown.

Meconine is also a new principle discovered by Pelletier. It is obtained from the æther used to procure the Narcotina. It is soluble in hot water, and crystallizes on cooling.

Codeine is prepared from the solution from which Morphine has been separated.

It appears to possess the exciting properties of Opium, and to exert a peculiar influence on the nerves of the ganglionic system, with little on the brain and spinal marrow, being chiefly useful in diseases of the nervous plexus.

From these discoveries it would appear, that the analysis of Opium is complete—that all the active principles have been separated and made tangible,—that detached from the inert matters which exist in this substance we have in the Morphine, the anodyne principle purely, unconnected with any other substances which give to Opium its distressing effects,—that in Narcotine we have separated the stimulating and stupefying properties of Opium, from which properties, consequences often arise so unpleasant, as to render the effects of it more intolerable than the disease—hence the benefit which modern discoveries in chemistry have conferred upon medicine.

M. Robiquet, considering the advantages which would arise from possessing an extract of Opium freed from the Narcotine, has furnished a process for that purpose, for an account of which I will refer you to Magendie's *Formulæ*.

The Poppy has been cultivated from very remote antiquity. Among the Greeks it served to ornament their gardens, and seems to have been known in the time of Homer,\* as appears from a passage in the *Iliad*, in which he compares a young soldier dying to a Poppy in a garden, its head stricken to the ground by the violence of the winds and rain.

It was no less common in the gardens of the Romans and the country, since Virgil† in his *Georgics* speaks frequently of this plant.

How its virtues came to be known, cannot be traced at this remote period. Various fanciful conjectures exist on this subject, with which it is not necessary to detain you.—conjectures which attribute the origin of its discovery to the Egyptians and to the Grecians. It was first employed internally by Hippocrates.‡ and it is probable that its properties were discovered about that time and in his country. This opinion is supported upon the authority of Diogenes, who lived about the time of Hippocrates.

Notwithstanding the knowledge of the virtues of this article, some time elapsed before it became freely used; and it is said, that Heraclites of Tarentum was the first who established its

\* Homer, according to Blair, flourished 900 years before the Christian æra.

† Virgil was born the year B. C. 70.

‡ Hippocrates flourished 460 years before the birth of Christ.



reputation. From this time, the inestimable benefits which it confers, became diffused through the world, and in every country all are ready to acknowledge the great and important effects derived from this merciful dispensation of Providence. Thus it is, in looking at the works of Nature, we are insensibly led to the consideration of Nature's God.

#### UPON THE APPLICATION OF OPIUM TO DISEASES.

It is my intention to speak of the Curative application of Opium. Before entering upon the subject, it may be useful to detail more at length its operations upon the different functions of the body.

1. *Upon the Animal Functions.*—I have considered Narcotics as Sensorial Stimuli and possessing an action in a great degree directed to the Brain and Nervous system. Opium is endowed with all these properties in the highest degree, and therefore both in its effects and its application is entitled to consideration. Given in a sufficient dose, it excites the energies of the mind, produces hilarity and much joyousness of heart, inspires resolution, and excites to deeds of bold and adventurous daring. In a moderate dose, the pleasing sensations which it produces are of a very agreeable nature—and though patients do not sleep, they often enjoy so perfect an indolence and quiet, that no happiness in the world can surpass the charms of this agreeable ecstasy. It is seldom that we have the opportunity of seeing Opium taken in such doses as to produce the very strong effects I have mentioned. If we judge from the descriptions of travellers among the Eastern nations, these effects are not too strongly depicted. Among the Turks, a dram is the ordinary dose, and they are said to take this quantity when they go to battle, or undertake any affair that requires vigor and strength.

Dr. Russell (History of Aleppo) also affirms that the immediate effects which he observed it to have on those who took it habitually, were an exhilaration of spirits, and from a dozing, depressed state, in which they sunk after passing the usual time of taking their dose, they became quite alert. I have already mentioned the effect of Opium in quickening the intellectual operations, and of renewing them to increased exertions after they had become languid and enfeebled. It possesses this power in a considerable degree, as I stated on the authority of the experiments of Dr. Leigh, when upon the subject of Diaphoretics. To these succeed those of diminished action and sensibility, marked by dulness and languor of body and mind, delirium and intoxication, which state finally terminates in sleep.

In large doses, the primary excitement is scarcely apparent, but the powers of life are instantly depressed, drowsiness and stupor succeed, and when the dose is excessive, these are followed by delirium, stertorous breathing, cold sweats, convulsions, and apoplectic death.

2. *Upon the Vital Functions.*—The action of Opium, in a small dose, upon the heart and arteries, is stimulating—increasing their contractions, and rendering the pulsations fuller, stronger, and quicker; this is followed by a weak and languid pulse, lowness of spirits, and some difficulty of breathing, or a sense of tightness about the breast.

3. *Upon the Natural Functions.*—Opium given on a full stomach, commonly occasions nausea from the beginning, which continues until the Opium is rejected along with the contents of the stomach. The secretions into the stomach and intestines are diminished, as well as those of the mouth and fauces; hence their dryness, and the sense of thirst which attends the use of anodynes.

There is considerable diminution of the biliary secretion: hence Dr. Paris observes, that the fæces of persons, after the use of Opium, are not unfrequently clay colored. The excretions are also diminished except the cutaneous, which as I have said under the head of Diaphoretics, is increased, with a singular itching on the surface of the body.

The operations of Opium upon the different functions, will of course be considered more in detail when treating of the diseases to which it is applicable. Let us however pause, and consider the variety of purposes to which it is subservient in the exercise of our profession. There are few diseases unaccompanied by pain, and very few indeed in which Opium may not be administered in some form or other with the advantage of mitigating sufferings, and without impeding recovery where recovery is possible. Where the disease is irremediable, and at the same time painful, what an inestimable friend have we in Opium! For my part, using the language of a very ancient writer, Sylvius De La Boe, I should almost be disposed to abandon the profession, were this medicine prohibited.

#### DISEASES IN WHICH OPIUM HAS BEEN RECOMMENDED.

1. *Continued Fevers.*—In most continued Fevers, whether Synocha, Synochus, or Typhus, whether originating in infection, or certain corruptions of human effluvia, there is at the beginning more or less of an inflammatory diathesis, and while this continues Opium will generally aggravate the symptoms and prove dangerous. It is also forbidden in the more advanced stage of these Fevers, whenever Topical Inflammation of the Brain is ascer-

tained, which sometimes exists and produces delirium, though other symptoms of the Nervous kind prevail. Where, however, symptoms of an inflammatory nature have passed off, and debility has made much progress—where there is delirium attended with subsultus tendinum, with watchfulness, a small, frequent, and weak pulse, Opium given in *small doses*, in conjunction with other remedies, so as to obtain its Stimulating operation, is one of our best medicines.

Delirium, it should be observed, arises from very opposite states of the system. In one case it is caused by increased action, and here it is inadmissible. In the other state, it is connected with want of action and attended with extreme inquietude and restlessness—here Stimulants, and particularly Opium, are our sole dependence.

2. In Intermittent Fevers, Opium in combination with other medicines was much used by the ancients; but since the introduction of Peruvian bark, it is seldom confided in for the cure of these disorders. It has, however, been strongly recommended as an effectual means of stopping the recurrence of the febrile symptoms, and has been given in the cold stage, in the hot, and during the interval, with the best effects.

Of its utility, given before the expected accession of the paroxysm, no one entertains the slightest doubt; but of the beneficial effects of the same practice during the hot stage, as recommended by Dr. Lind, there does not exist the same unanimity. By Dr. Lind, with whom the practice originated, it is declared to be productive of the following good effects. 1. A diminution of the violence of the paroxysm, and relief to many distressing symptoms, as headache, and the burning heat of the surface of the body—the speedy production of perspiration. It is also stated to render the constitution more susceptible to the operation of bark, and prevents those abdominal obstructions which so often follow in the train of this disease. Notwithstanding these high encomiums, the practice has not been generally adopted. Opposed as it is to the prejudices we entertain of the operation of the remedy, and the nature of the disease during this stage, it has met with few advocates. From my own experience, I can say nothing of it, nor do I know of any of my medical friends who have given it a trial; but the authority by whom it is sanctioned is so respectable, that I think it justly entitled to your attention.

3. In Inflammatory Diseases the use of Opium has been condemned, and it has been established as a general rule, that Opium is improper in all those diseases in which bleeding is necessary. The principle has been much disputed, and it is liable to numerous exceptions.

In Pneumonia no one thinks of giving Opium until the inflam-



mation has been subdued by V. S. and other remedies, and not then, unless symptoms of nervous irritation call for its use. Dr. Cullen very judiciously observes, that in the *beginning of the disease*, before bleeding and blistering have produced some remission of the pain, and of the difficulty of breathing, opiates have a bad effect, by increasing the inflammatory symptoms. But in a more advanced state, when by copious Venæ Section we have blanched the patient, and rendered further detraction of blood hazardous without completely subduing the disease, a large dose of Opium may be administered not only with safety, but with the greatest benefit. It will generally, in such cases, allay that irritability of the system, vascular and nervous, which seems to renew the inflammation from time to time, while bleeding becomes less and less adapted to its final reduction. Many cases may be cited of the beneficial effects of this practice, and of the relief which followed the use of Opium in pulmonary inflammation after proper depletion. As Opium alone tends to check expectoration, which is one of the modes nature pursues to relieve inflammation of these organs, it is proper to combine with it some Expectorant medicines, as squills, ipecac., wine of antimony, gum ammoniac, &c.

4. In Spasmodic Asthma Opium often exhibits the best effects—in many cases shortening the paroxysm, and very often removing the complaint entirely. By relieving the spasm, the difficulty of breathing, with the sense of oppression about the thorax—the dry cough, wheezing, &c. very quickly subside. When the disease depends upon a spasmodic affection of the bronchiæ, Opium will often afford very great relief.—But it is not every case of seeming Asthmatic disease that will admit of treatment by this means. That you may be convinced of this fact, I will bring to your view some of the exciting causes of this disease. Very frequently it depends upon some obstacle to the course of the blood, and this obstacle is most commonly disease of the heart, in consequence of which a free circulation being prevented, congestions take place in the lungs, and especially the membrane lining the air cells.

An inflamed state of the mucous membrane of the bronchiæ, will often give rise to a paroxysm of asthma, and hence asthmatic breathing attends so frequently in catarrhal affections, and in influenza.

Very frequently the disease depends upon a disordered condition of the stomach and intestines.

The treatment, therefore, will vary with the nature of the exciting cause; and hence, in all cases, diligent application should be made to discover the manner in which the disease is produced, and to treat it as the case requires. A knowledge of the various causes by which this symptom is produced, will aid you essentially

in the application of your remedies, and divest your treatment of much of the empiricism which must otherwise be practised.

5. In Catarrhal Affections it proves of the highest utility, by allaying the irritation whence the cough arises. It requires, however, to be used with caution, where the disease is in its acute stage, and accompanied with inflammatory action. Under these circumstances, it should be combined with some Diaphoretic, either antimonial or ipecac., by which its direct Stimulant operation is obviated, and its operation determined to the surface of the body.

6. In *Phthisis Pulmonalis*.—In the advanced stage of this disease its utility is eminently conspicuous. It is in chronic affections like the present, that this medicine becomes entitled to our gratitude. It allays the violence of the cough, produces sleep, checks the inordinate evacuations, and ultimately assuages the pangs of departing life. Its euthanasial virtues in this, as well as many other diseases (Eberle observes) that lead with unerring steps to the grave, are indeed among its most admirable qualities, and would alone be sufficient to entitle it to the highest attention.

7. *Rheumatism*.—Of the use of Opium in this disease little need be said, as the opinions of practitioners are pretty well made up on this point. The disease is purely of an inflammatory nature, and if Opium is employed it must be so directed as to produce perspiration, whereby the inflammatory disposition is carried off. Hence the value of the Dovers powder in these complaints, which while it allays morbidly increased sensibility, promotes the cutaneous discharge. But even this is not admissible until by depleting remedies, arterial action has been considerably subdued. There is a form, however, of acute rheumatism, in which Opium may be used earlier. It is attended with extreme mobility and irritability of the system, and occurs particularly in women. Here Opium alone or in combination with bark, will be found highly useful. In the rheumatism of secondary syphilis, Opium may be combined with mercury with advantage.

8. As respects the utility of Opium in Gout, physicians are by no means agreed. Sydenham, upon the principles of the Humoral Pathology, considering pain to be the disagreeable remedy of nature, and a security to the patient's life, seldom resorted to Opium. Dr. Cullen observes, that opiates give the most certain relief from pain—yet when given in the beginning of gouty paroxysms, they occasion them to return with greater violence.

As a rule of practice always requiring careful consideration, any excessive state of inflammatory diathesis should be removed previously to the administration of Opium. To this rule there are exceptions, and the present case is one in point. The inflammation in the present disease is frequently dependant on local and

general irritation of the nerves—and our rules of treatment must often be varied from that, we observe in the primary, excessive action of the vessels in common inflammation, from which the nerves become affected in a secondary manner.

In these cases, Dr. Scudamore observes, that when a patient has described the pulsatory throbbing of the inflamed part to resemble almost the blows of a hammer; when the heart has been in ordinate action, and the inflammatory diathesis has appeared altogether urgent, he has witnessed the happy power of a free administration of Opium in causing an abatement of the action of the vessels, and procuring universal tranquillity in a short time.

In the Atonic or Retrocedent Gout, when it attacks the stomach, there can be no doubt of the utility of Opium, and it ought not to be neglected; but it must be given in large doses, for such is the loss of susceptibility, that  $\mathfrak{z}\text{ij}$ . laudanum have been taken in a very short time, with but little impression on the system. It is best to combine it with vol. alkali, æther, ginger tea, spiced wine, hot toddy, &c.

9. In the Phlegmasiæ of the Mucous Membrane, especially of the Primæ Viæ, Opium is a most valuable remedy, and indeed it may be said we can do nothing without it.

10. In Dysentery it may be considered as indispensable. The employment, however, must be regulated by the general state of the system. In the commencement of the disease, when febrile symptoms run high, Opiates would obviously be improper, but when excitement has been reduced by V. S. and other anti-inflammatory measures, it may be employed with advantage. It will be found to allay irritation, to diminish the perpetual nîsus to evacuate, and to restrain the inordinate secretion of acrid fluids, which are highly distressing in these complaints. As a general rule, it may be stated, that Opium can be resorted to at a much earlier period in inflammation of the mucous membranes than of the serous. In these cases it is best combined with ipecac. or antimony, than given alone. Its astringent operation is less considerable than has been imagined, and it is a fact, that sometimes no medicine more effectually procures stercoraceous stools than Opium.

11. In Diarrhœa its utility is equally conspicuous. Diminishing as it does the intestinal secretions, and allaying the irritated motions of the muscular fibres, it will be found a very important article in diminishing the too profuse discharges from the bowels. It is best to combine it with some Diaphoretic, as the great principle in obviating the injurious effects of Opium, or diminishing undue discharges in a part, is to excite some other secreting organ into action, and none more advantageously than the cuticular secretions.

12. In Cholera Morbus, connected as it is with great intestinal



irritation, extended to the liver, this medicine is of considerable utility. The degree of irritation is sometimes so great, that evacuates become necessary before resorting to anodynes. The evacuates are commonly of the mildest nature, but after they have been carried to a sufficient extent, Opium will be found of the highest importance in allaying the irritation of these parts. It is commonly recommended combined with a Diaphoretic, upon the principle of revulsion, but I believe that calomel will be found a better combination, from its powerful operation in altering the morbid action of the liver.

13. In Bilious Colic, and in Colica Pictonum, the virtues of Opium cannot be too highly extolled. In these cases it is fully proved to be the *Magnum Dei Donum*. Consisting as these diseases do in great morbid irritability of the whole intestinal canal, connected with spasmodic constriction—medicines that are successfully resorted to in other cases are here speedily rejected—our only resource is Opium given in combination with calomel in such quantities as will allay pain and evacuate the intestines. The constipation in such cases is very great, and nothing that can be used promises to be more successful. Other purgatives by their bulk or irritating quality are speedily rejected, but this combination possesses the advantage of allaying spasm, and allowing of a purgative operation. In these diseases Opium must be given to a large extent, for it may be remarked, as a general rule, that during the existence of violent pain, the susceptibility of the system to the action of Opium is greatly diminished, and the doses must be large and often repeated. Upon this subject Dr. Scudamore observes, (*Treatise on Gout*, p. 126,) that so powerfully does pain modify the influence of Opium on the nervous system, in any kind of disease, that it may be given in the boldest doses without hazard or ill effect when pain is intense—and in no way, except by the active repetition of such doses, can it be really efficacious when the occasions for it are urgent.

Colica Pictonum seems to consist principally in a spasmodic affection of the colon, by which the fæces are locked up between its circular bands. The object, in its treatment is, to remove the fæces by means the least irritating, and as in this case the costiveness depends upon spasm, Opium will act as a purgative, which may be united with calomel or castor oil, or sweet oil, given very freely. In favor of the practice of giving large doses of Opium or Laudanum, it has been observed by De Haen, that Paralysis does not succeed attacks of Colic so frequently when the cure of it has been effected by Opium, as when the complaint has been removed by other means.

14. In Dyspepsia Opium often affords much relief to the very distressing pains which are produced by this disease. The precise

stage in which it should be used is not accurately pointed out; but it affords great benefit in a burning kind of pain which is referred to one spot and which is increased upon eating anything. Various antacid remedies have been employed for the removal of this symptom, but the advantages arising from them have been very inconsiderable. Opium has been directed in doses of gr. ss. taken before each meal so as to allay the irritability of the stomach and dispose it for food. This practice has succeeded most happily, and the condition of the patient has been much improved by it.—*Whytt's Treatise on Nervous Diseases.*

15. In Hæmorrhagies Opium has also been recommended. The utility of this practice has been inferred from the power of Opium in restraining evacuations, and by most practical writers its use has been commended in such cases. But in its administration some caution is required, and the article may have suffered injury from being too indiscriminately employed. In active Hæmorrhagies it is certainly improper, nor should it be resorted to, until by depleting remedies the excitement of the system has been reduced. Under these circumstances it will be found of much service in allaying irritation, and quieting the mobility of the system. If it is ever a useful remedy in Hæmorrhagies of the active kind, it is when this depends upon much irritability of the system, by which the discharge is frequently excited. In Hæmoptysis, therefore, when the spitting depends upon a cough proceeding from irritation, Opium will be of essential service. It will be usefully combined with Ipecac.

16. In Uterine Hæmorrhages connected as they most commonly are with spasmodic contractions of that organ, Opium by diminishing these contractions, allows the formation of coagula, by which the further effusion of blood is prevented. It is combined with sac. saturni, the efficacy of both articles being increased by their union.

17. In the diseases of the class Neuroses, Opium has been a favorite remedy, but in my opinion its value has been overrated.

In Tetanus, I have but little confidence in this article, having employed it to the fullest extent, and in several cases witnessed its anodyne operation without any diminution of the spasms, except in a single instance when it was applied to an extensive ulceration of the foot. I am, therefore, disposed to establish my hopes of curing this disease upon other remedies, as I am fully convinced of the insufficiency of the present. Broussais ridicules the idea of treating Tetanus as a nervous and spasmodic affection by Opium, anti-spasmodics, mercury, cold and warm baths, &c. It must be treated, he says, as we treat arachnitis, or spinitis—that is, by applying leeches along the vertebral canal, and along those muscles in which an excess of nervous influence is directed. He strongly censures

the administration of Opium in this disease. He avers that this medicine excites disorder of the stomach and head, which disorder reacts upon the spinal irritation and inflammation, and consequently increases the disease. Upon the same principle he abstains from all violent purgatives, considering the obstinate constipation as the consequence of the disease, and to be remedied by the removal of its cause. M. Broussais asserts, that treated upon these principles, the disease has ceased to be half so formidable as it formerly was in the Val de Grace, and in other places where the physiological doctrine is taught.

18. In Hydrophobia there is but little to be said—when genuine it is incurable by any remedies known, but when symptomatic of other diseases it may be relieved. In Chorea St. Viti its use is very dubious. It has been recommended by some practitioners, but I think it is more successfully treated by other remedies, particularly by purgatives, as I mentioned when upon that subject.

19. In ordinary Hysteria it has been too much praised. It can never effect a cure, but it will be found useful in palliating some of the most distressing symptoms; the habitual use of it increases the mobility of the system, and hence women who are in the habit of taking it in considerable quantities are usually hysterical.

20. In Epilepsy it cannot be said to exert any beneficial effects. This disease, as well as some others of this class, are either dependent upon, or attended with symptoms of gastric irritation, and is to be treated by evacuating the primæ viæ by emetics and cathartics. Sometimes V. S. is necessary, and topical bleeding when inflammatory action or a determination to the head exists. Opium may be useful in those cases of Epilepsy which are preceded by the aura epileptica, or in cases where the period of accession could be foreseen. Given here when the symptoms announcing its approach have come on, it has been found an effectual remedy. It is also the practice of some physicians to give an emetic as soon as the premonitory symptoms of an approaching fit appear, and it has been said to have prevented the formation of it, and in some cases to have cured the disease.

21. In Mania Opium has been much used, but with little discrimination to the cases, or the stage of the disease. As a general rule, it may be laid down, that as long as much excitement exists, Opium is likely to be injurious, nor ought it to be resorted to until by V. S., purging and cold applications, the inflammatory action of the cerebral organs has been reduced. But in the weaker forms of Mania, or after the system has been reduced by the anti-phlogistic means, opiates are serviceable.

There is, however, a species of Mania in which Opium exhibits the happiest effects; I mean that grade of mental derangement which arises from the use of ardent spirits, or as it is called *Mania*



*a Potu.* This disease is known by several other terms, as mania a temulentia, febris temulenta, delirium tremens, &c.; and it appears in persons who having indulged to great excess in the use of ardent spirits, are by accident or other causes suddenly deprived of it. From all that we know of the causes, it would seem that this disease consists in a peculiar morbid action of the brain and nervous system, brought on by the intemperate use of ardent spirits.

The prominent symptoms by which this disease is distinguished, are delirium, incessant watchfulness, the dread of some frightful or disgusting objects, tremors, with picking at the bed clothes, a pulse variable and generally more frequent than natural. Various plans of treating this disease have been recommended, influenced by the degree of vis vitæ existing in the system, and the condition of the circulation. These are V. S., emetics, the cold and tepid baths, or the use of Stimulants, as opiates, brandy, vol. alkali, camphor, &c. It is not my province to speak of the respective stages in which these different remedies are applicable—cases will be met with in practice, in which they may all be employed according to the judgment of the practitioner. I may state that it is upon Opium our hopes of relief are often directed.

The powers of this article in allaying irritation, and inordinate action of the nervous system, with its wonderful property of inducing sleep, renders it peculiarly suitable to this disease. This is so remarkably the case, that as soon as sleep can be induced the patient as certainly wakes up tranquillized, his delirium vanishes, his waking dreams are no longer of a distressing and agitated character, but calmness and composure succeed to the place of restlessness, raving, and a host of the most conflicting and tumultuous emotions. But to obtain these effects it must be given largely, until its anodyne operation is induced. In our employment of it, however, we must be influenced by the previous habits of the patient, as a larger dose will be required to produce its specific effect upon a confirmed drunkard, long accustomed to the free use of ardent spirits, than upon persons less habituated to the use of stimuli. By pursuing this practice many patients have been saved, who would have been lost by a contrary mode of proceeding.

22. In Syphilis Opium has been a good deal extolled, and has been said to possess specific virtues. The experiments of Dr. Pearson are fully decisive upon this point, and they appear unfavorable to the character of Opium as an anti-venereal remedy. It may, however, be used with freedom during a mercurial course, for its tendency to prevent the stomach and bowels from being disordered, and from lessening the irritability and restlessness produced by the introduction of mercury into the constitution.

In combination with mercury, it restrains its purgative opera-

tion, so that the constitution is speedily placed under its influence, and in the sequelæ of the venereal disease it is a very useful medicine in relieving pain, and in some cases even altering diseased actions.

There is, however, one of the forms of this disease in which Opium exerts a primary operation, viz. Gonorrhœa, in which it is used with great advantage. It was the practice of the late Dr. Kuhn of Philadelphia, to trust to Opium in the cure of this troublesome affection, and he recommended its use in doses of 2 grs. at night and one gr. in the morning. This practice has been imitated by others—its utility fully corroborated; and I have employed it with decided advantage in a few cases.

In all ulcers, whether of a venereal character, or not, a decoction of Poppy heads made into a poultice, is a very useful application.

I have brought before you a long catalogue of diseases in which Opium is employed without at all exhausting my subject. A detail equally long might be made of other diseases, in which at one period or other Opium may be efficaciously used. The diseases I have enumerated are the most important, and those in which its good effects are chiefly manifested. But besides these diseases, there are a host of chronical affections, in which Opium, by lessening the sufferings of the patient, allows the steady adherence to a proper plan of treatment, and by soothing his distresses, admits of regular progressive steps towards a cure, and begets confidence in the exertions of the physician. It is in my opinion not had recourse to as often as may be useful, and from much practice with it, I entertain less dread of its use than many of my professional brethren.

#### OF THE EXTERNAL APPLICATION OF OPIUM.

Upon this subject there exists a difference of opinion, it being maintained by some, that applied in this manner, it is almost as efficacious as when taken into the stomach, and that it produces its Anodyne effects without affecting the head or occasioning nausea. This account is as unfounded as that maintained by others, that no constitutional impression follows its external use.

In support of the external use of Opium, we have the authority of the venerable Dr. Cullen, who says, that it operates not only on the parts to which it is immediately applied, but that without being communicated to the sensorium, it operates upon the adjoining nerves, in diminishing their sensibility, and thereby relieving pain.

Opposed as this opinion is by Jackson, Crump and others, I have no hesitation in stating, that judging from the effects of the local

application, we must conclude that it exerts an active operation on the surface, and that this is often extended to the sensorium commune. Thus, applied by friction, it relieves the pain of cramps, and rubbed over the abdomen it lessens the pains and spasms of the stomach and intestines. The good effects of pledgets soaked in laudanum, and applied to the scrobiculus cordis have been noticed by practitioners in these cases, and it has been said to be useful in symptomatic trismus when rubbed on the jaw.

When the stomach rejects the external exhibition of Opium, it may be successfully applied along the spine by friction with the camphor liniment, or, what is more efficacious, in combination with olive oil.

By the Italian physicians, however, the external application of Opium or Laudanum is more highly recommended, and employed either in the form of ointment or frictions with Laudanum, the sleep produced by it, though not proportioned either in intensity or duration to a dose taken internally, yet a state of calmness always follows its use. I have never employed the Opium ointment to the sound skin in any case that I recollect; but in a case of Tetanus, originating in an extensive destruction of the skin of the foot, (the entire skin of the sole being removed,) I derived the happiest effects, and complete relief to all the spasmodic symptoms, by dressing the ulcerated surface with strong Opium ointment in the proportion of a  $\text{ʒi.}$  of finely powdered Opium to  $\text{ʒi.}$  of simple cerate, and of the effects of Laudanum applied to the skin I have on many occasions been satisfied that they were obvious and considerable.

*Opium Enema.*—A more common form of using Opium when it cannot be given by the mouth, is in the form of glyster. It is very useful in allaying irritation of the bladder, uterus, or rectum, and the usual mode of employing it is by combining Laudanum with a solution of starch or rice gruel. The quantity of fluid should be small, as the object is to retain it in the rectum. If large, the distension of the rectum produced by its introduction, excites contraction of the muscular fibres, and it is speedily expelled without answering the purpose intended. It may be observed, that the quantity of Opium used in the form of glyster should be treble of that taken by the mouth.

Effects similar to those of the glyster are obtained by introducing a *pill of Opium* up the rectum, or a suppository, and sometimes this is less objectionable with some patients.

#### MORBID EFFECTS OF OPIUM.

Opium diffusing so many blessings, and bestowed as it has been upon mankind for the relief of pain, and the mitigation of the



infirmities of our nature, like others of the most valuable gifts of Providence, is employed for the worst of purposes, the destruction of life.

The symptoms which follow a large quantity of this article, taken either designedly or from accident, are a general relaxation of the whole muscular system—the head falls lifeless on the breast, the eyes are shut, and the countenance is ghastly. The respiration is slow, and stertorous, like apoplectic breathing. The pulse is usually slow and full, or feeble and irregular, and such a degree of insensibility exists, that the patient can only be roused with the utmost difficulty.

The symptoms call for immediate relief, and when the patient has the power of swallowing, an emetic of sulphate of zinc, and if this does not succeed, of sulphate of copper, in doses adequate to the emergency, should be resorted to.

After vomiting has been excited, the patient should be carried about from one place to another, irritating applications be made to the feet, and strong coffee, or lemon juice, or vinegar and water, be frequently offered. Should the powers of the system decline, Stimulants must be resorted to, as the volatile alkali, camphor, and other Stimuli.

Should deglutition be interrupted, and render it impracticable to introduce any emetic article into the stomach, with extreme torpor and insensibility, the affusion of cold water over the head, and shoulders, has been found productive of the happiest effects in rousing the patient from this state of insensibility. The emetic must be administered as soon as it can be taken, and the affusion repeated whenever the torpor returns. By the employment of the cold water, the specific operation of Opium is destroyed by the shock given to the system, and by being repeated, the operation of the emetic soon follows with relief to all the most distressing symptoms. This method of treatment by the cold affusion, I am satisfied, will prove a valuable addition to the usual methods of recovering the system from the noxious operation of Narcotic substances.\*

Much has been said of the efficacy of several substances as *antidotes* to the poisonous action of Opium, which may properly be considered. These are vinegar, and the vegetable acids, the infusion and decoction of coffee, chlorine dissolved in water, camphor, mucilaginous drinks.

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\* *Cold Affusion.*—In Turkey, if a person happens to fall asleep in the neighborhood of a Poppy field, and the wind blows over it towards him, he becomes gradually narcotised, and would die, if the country people, who are well acquainted with this circumstance, did not bring him to the next well or stream, and empty pitcher after pitcher on his face and body. This occurred to Dr. Oppenheim during his residence in Turkey, and he owes his life to this simple but effectual treatment.—*Dr. Graves' Lecture.*

From the experiments of Orfila, it has been demonstrated, that the administration of these substances previous to the evacuation of the Opium, will accelerate and aggravate its action. Their injurious operation under these circumstances, depends upon diluting the Opium, and thereby enabling the absorption to go on more rapidly; but that, administered after the substances have been expelled by vomiting, they possess the property of diminishing the symptoms of poisoning, and even putting an end to them altogether. Let it, therefore, be understood, that none of these substances, as vinegar, coffee, &c. can be looked upon in the light of antidotes, but that they diminish and correct the effects which have been produced, after the Opium has been evacuated.

In a former lecture I noticed the action of acids upon Narcotine, and observed that 24 grs. united with vinegar might be given with impunity, when a single grain produced stupefying effects upon dogs. No inconsistency will be charged to me from the above statement, when it is considered that Opium owes its poisonous qualities to the Morphia as well as to the Narcotine which it contains, and that the Toxic quality is to be attributed chiefly to the Morphia, since the extract deprived of the Narcotine kills animals in the same space of time as the common extract.

M. Robiquet, considering the advantages which would arise from possessing an extract of Opium freed from the Narcotine, has furnished a process for that purpose.

Besides these means which are commonly resorted to, and which generally are sufficient, it was proposed by Dr. Physick, and afterwards in England, to evacuate the stomach in these cases by introducing a flexible tube into that organ, and with the aid of a syringe closely adapted at one end, its fluid contents may easily be removed. This plan has succeeded in a few instances.

It is superseded by the more convenient and useful instrument, the stomach pump.

Another method proposed for recovering persons from the poisonous effects of Laudanum, is artificial respiration.

The following case of recovery by this means, will be interesting.

A dose of Laudanum, 25 or 30 drops, by mistake was given to a child 10 days old instead of the mother. Upon the physician in attendance visiting the child the next morning, it was found presenting the following symptoms. Face of a dark, livid color, respiration slow and oppressed, repeated about 6 or 8 times in a minute, pulse slow, weak and tremulous, extremities cold, coma, and dilated pupils. It had convulsions a few hours after taking the Narcotic draught. The power of deglutition was suspended. The case being considered desperate, a female was directed to keep up artificial respiration by blowing into one nostril, closing

the other, and by pressure on the abdominal muscles, imitate inspiration and expiration. This was persevered in for half an hour, without much apparent amendment, except an occasional convulsive effort to expire the air blown in. Perseverance was enjoined, and respiration was completely re-established, the face assumed its natural color, and all the functions were restored. No unpleasant symptoms ensued, and the child recovered.

Opium acts chiefly upon the respiratory and sympathetic ganglia. If respiration can be sustained by artificial means till the sedative influence of the Opium can be subdued by the recuperative energies of the system, life may be restored.—*N. A. Med. and Surg. Journ.*, Vol. III., p. 278.

Another method of treatment has been recommended, by means of Emetics per anum, illustrated by the following case.

A robust, middle aged man, of intemperate habits, swallowed  $\frac{z}{i}$ ss. of Laudanum, for the purpose of destroying himself. Attempts were made to rouse him with some success, but he refused to take anything. The œsophagus tube of a stomach pump was introduced into the rectum, and passed gently on the distance of 23 inches. In doing so, whenever any resistance was experienced, the introduction of the tube was suspended, and a fluid pumped into the intestine to dilate it. By this means the tube was passed on without further difficulty. The tube was thus carried to the proper extent, when half a gallon of water containing 15 grs. of tartarised antimony was slowly pumped into the colon. This done, the patient complained of nausea and an inclination to evacuate the bowels, followed by full vomiting, repeated several times successively. The disposition for alvine discharges passed off without further effect. The evacuations were renewed by 10 grs. more dissolved in a quart of water, introduced as before, and to increase its effects the tube was withdrawn to within 3 inches of the anus, and a saline enema administered. This operated copiously, and the patient was relieved next morning. All the Narcotic symptoms had disappeared.

The same means may be used in obstinate constipation and in colic, for the purpose of throwing up purgative medicines.—*Am. Journ. Med. Sci. Feb. 1831.*

*The Doses of Opium.*—The Dose of Opium is influenced by the nature of the constitution, and the circumstances under which it is prescribed. A quarter of a grain will in one person produce effects which ten times the quantity would not do in another, more especially if he has been previously accustomed to the use of it; and a dose that would prove fatal in colic or cholera, would not be perceptible in many cases of tetanus or mania. These circumstances being considered, the medium dose for an adult will be 1



gr. which is equivalent to 25 drops of Laudanum. But it is often safe and proper to give more than a grain, and whenever there is any irritation in the system to be overcome, it is commonly necessary to go still further. Thus, if moderate doses, which should always be commenced with, do not answer, they must be repeated and increased until the desired effect is obtained; and in this manner the doses of this article may be pushed with safety to a great extent. In the case of gout in the stomach, it has been given by degrees to the quantity of 10 grs. twice a day, and in tetanus, hydrophobia, and mania, it has been given in still larger doses. Dr. Binns, of Liverpool, has given as much as ℥ii. of solid Opium at one dose in mania, and some other practitioners of the same place have given it as profusely in this disorder, and, as we are told, with good effects. But it will be right to wait for further testimonies of its safety and efficacy before it can be recommended to be prescribed in maniacal and other cases in such hazardous quantities. The free exhibition of Opium in some of the diseases just mentioned, as well as in intermittents, cholera morbus, typhoid fevers, and some species of gangrene, may be reckoned among the greatest improvements in the modern practice of physic.

Respecting the exhibition of Opium, I may remark, that in many instances, especially in cases of consumption, scrophulous affections, and cancer, the intention of allaying pain and irritation will be better fulfilled by giving this medicine in moderate doses, combined with the ext. of hyosciamus, or ext. conii, than by giving it in larger quantities. For to repeat what has been so often urged, it is with the Narcotics as with some other medicines, two or more joined together, in different proportions, often produce a better effect than any one of them exhibited in a double quantity.

It is proper to consider the doses of Opium in persons below the adult age.

For a person between the years of 5 and 10, the quantity contained in from 5 to 10 drops; and from 1 to 2 years, the quantity contained in from 1 to 5 drops.

For a child three days old, 1 drop of Laudanum is to be mixed with a dram of water, and half of it taken, and some time after, the remainder, if necessary; but even half a drop sometimes produces violent effects. At no time within the month ought more than one drop to be given at a dose.

In speaking of the doses of Opium, it should be observed that no medicine loses its power by repetition sooner, and therefore we are called upon, either to augment the dose when it is necessary, or to repeat it at shorter intervals. Dr. Chapman states that he knew of a person who took ʒvj. of Laudanum a day, and he says that a well authenticated case occurred in Philadelphia, under the care of Drs. Monges and La Roche, of a female

laboring under cancer of the uterus, who took 3 pints of Laudanum a day for some weeks. Such cases are not common; they shew, however, the influence of habit, and the extraordinary power of the system in accommodating itself to the most deleterious substances.

The long continued use of Opium produces effects similar to those which follow the action of ardent or vinous spirits. In their good and evil effects they are nearly allied. Thus Platerus affirms that wine is Narcotic, and Sydenham, that Opium is the best cordial in Nature.

The habitual use of Opium greatly impairs the constitution. Persons who accustom themselves to it, can by no means live without it, and are feeble and weak; they are usually thin, and often of a yellow complexion, and look much older than they really are. Some of us in this country may have observed the effects of this deleterious practice, which lays the foundation of a number of distressing feelings usually termed Nervous, with paleness, emaciation, an apathy equally of mind and body, and premature death.

*The Official Preparations of Opium.*—These have been very numerous, but are now reduced to a few. Opium yields its active principles to several menstrua, as proof spirits, wine, vinegar, water.

With alcohol is formed the preparation so much in use, called Laudanum. In it is contained all the active principles of Opium, and it is given in all those cases in which Opium is usually employed, “being more speedy in its operation, more manageable in its dose, and more convenient for combination with other remedies.”

Twenty-five drops of Laudanum are considered equivalent to one grain of Opium.

The next is Paregoric Elixir, as it is commonly called, or the Camphorated Tincture of Opium. Here the Opium receives additions from the Camphor and other substances which enter into its composition. It gets an agreeable flavor from the Benzoic acid, and oil of aniseed, and it is at the same time more stimulating. It is also a less unpleasant medicine than the former, and from being more safe, is much employed by nurses in the diseases of children.

This preparation was originally prescribed under the title Elixir Asthmaticum, and from its use in allaying the tickling which excites to frequent coughing, and in other Pectoral affections, it does not ill deserve the title.

A dram of Paregoric contains about 6 drops of Laudanum or  $\frac{3}{8}$ ss. is equal to 1 gr. of Opium.

Wine extracts the virtues of Opium, but the menstruum is objectionable on account of its soon getting sour. Since, however,

the Acetate of Morphine has been in repute, wine is not so objectionable a solvent as was supposed. Instead of it, vinegar is employed. This menstruum has been much esteemed since the discovery of the composition of the Lancaster or Quaker's drop.

It consists of a solution of Opium in vinegar, to which is added nutmeg and several other ingredients. By this combination, acetate of morphia is formed, and the anodyne properties of Opium are increased in consequence of the formation of a soluble salt with morphia. It has too the advantage of producing sleep without those distressing consequences which in some constitutions follow the alcoholic solution. With vinegar, therefore, a preparation of Opium is formed, which was thought more active and less distressing in its effects than any other Narcotic combination. For a particular mode of making this preparation, vide Chapman's Therapeutics.

*Denarcotised Laudanum.*—Allied to this preparation is the Denarcotised Laudanum. It is prepared by digesting Opium with sulphuric æther at the temperature of ebullition, in such quantities as are sufficient to cover it, and renewing the quantity successively every 24 hours four different times. Æther is selected because of its power of dissolving Narcotine, and separating this principle from the active principles. The æther, upon evaporation, exhibits crystals of Narcotine.

To the Opium thus prepared, as much diluted alcohol is added as is sufficient to make a tincture. This preparation has been employed with advantage in delicate and nervous persons, in whom the ordinary preparation was attended with distressing effects upon the stomach and head, without any such unpleasant consequences. A lady on whom it had been employed, and who had always suffered from the distressing operation of this article upon the nervous system, called it the divine tincture of Opium.

*Denarcotised Acidulous Tincture of Opium.*—To  $\frac{5}{16}$  i. of Opium digested in æther until it no longer acts upon the Opium, add

Spts. of Wine,  $\frac{3}{4}$  vii.

Strong Acetic Acid,  $\frac{3}{4}$  ii.

Water,  $\frac{3}{4}$  vj.—digest for 7 days and filter.

This preparation is more advantageous than Laudanum or the Black Drop. It has the following advantages, containing no Narcotine, possessing the Acetic Acid, thus increasing its calming effects, and forming the Acetate of Morphia. It is further, a more uniform preparation than the Black Drop.

*Salts of Opium.*—The alkaloids, in their pure state, are by no means so active as when combined with acids. Thus combined, they manifest their powers sooner and with more energy, in consequence of their greater solubility.

*Acetate of Morphine*—Is white, inodorous, and of a bitter taste;



it is very readily dissolved in water. The dose is from the  $\frac{1}{8}$  to the  $\frac{1}{4}$  of a grain. It is given in the form of pill, or dissolved in water, or taken in syrup.

*Sulphate of Morphine*.—Is the next most active, and is employed where patients have been accustomed to the use of the acetate—for generally, by varying the salts of Alkaloid medicines, their action may be kept up longer without increasing the dose too considerably. It has been preferred to the acetate in consequence of its composition not being so liable to vary.

Sulphate of Morphia has a considerable resemblance to Sulphate of Quina,—and as this latter salt is now in very general use, the medical practitioner will do well to remember the following simple test, proposed by Dr. Paris—by which they may be distinguished—which is, that the Sulphate of Morphia treated by concentrated nitric acid becomes red, whereas no such effect is produced with the Sulphate of Quina.

*Citrate of Morphine*.—Recommended by Dr. Porter, of Bristol, is prepared by treating Opium with Citric acid by simple maceration. This preparation has been supposed to act more speedily and powerfully, but not in so permanent a manner as Opium.

*Narcotine*.—Of this other elementary substance existing in Opium, nothing is known very satisfactory. It seems to be much less active upon the system than morphine, requiring to be given in larger doses. It is Narcotic in its effects, and to it is attributed the pruritus, or itching, which in some constitutions follows the use of Opium. From the bitterness of its saline solutions, it has been recommended as a substitute for quinine in the treatment of Intermittent Fevers.

It is given in doses of one to 5 grains.

*Codeine*.—Like Opium, and all medicinal substances derived from that drug, Codeine operates upon the Nervous system, but its medicinal influence seems very small upon the brain. It makes no impression whatever on the spinal marrow, or nerves derived from it, and its whole activity seems to be exhausted on the nervous plexus of the great sympathetic.

It is administered in a dose of from half a grain to a grain.

To the advantages already detailed as arising from the employment of the active principles of vegetable substances as therapeutic agents, it may be added that they may be introduced into the system, through the medium of the skin, in sufficient quantities to affect the constitution.

They may be resorted to when the stomach is so irritable as to reject everything in the way of medicine. This mode of introducing the active principles into the system is called the subepidermic, and the practice consists in removing the cuticle by means of a blister, and applying the salt to the surface. Strychnia and quinia

have been so employed—the one in paralysis of the hand, and the other in Intermittent Fever, and with advantage. Morphia may be so used in rheumatism, sciatica and neuralgia. It has always afforded ease when brought into contact with the skin, and the pains return upon its being discontinued.

Water is the last of the solvents of Opium which is employed, but it is a very imperfect one, and can scarcely be used with advantage. It dissolves the gummy part of Opium, a small portion of the resin, a little of the salts, and is not therefore without some degree of activity.

Opium is sometimes employed in the solid form—and is used whenever it is desired to operate slowly—or to act upon the stomach and intestinal canal, as in colic or diarrhoea, &c. It is also more likely, in the form of pill, to be retained on the stomach in irritable affections of that organ, than in a liquid state, in which case it is often resorted to.

Having thus completed what is most necessary in the history of this valuable article, upon which Sydenham pronounced the following eulogium:—*Ita necessarium est Opium in hominis periti manu, ut sine illo, manca sit, ac claudicet medicina.*—*De Dysenteria.*

With these remarks we complete the article Opium, and from what has been said, our description of the Narcotics might almost cease with it. But it may be observed, that there are cases in which other articles are to be preferred to Opium, and in which these substitutes are not only valuable auxiliaries, but are even superior—as for instance, Hyosciamus, in affections of the head, is preferable to Opium—Belladonna, as a local application in painful affections—Cicuta, from its peculiar influence upon the Nervous system, by which pain in some of the most sensitive parts is more immediately lulled, as in diseases of the Prostate gland, and in cancerous affections—Digitalis, for its power of controlling the action of the heart and arteries, and so on.

It is therefore important, and necessary, that we should prosecute the study of the several articles included under the Narcotics, as their particular, and more peculiar uses will be more fully brought before you.

I proceed to the consideration of another possessing properties very analogous—this is the

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*Family Synanthèreæ—Lactuca Sativa and L. Virosa—Garden Lettuce.—Lactucarium or Thrydace.\*—From these plants there exudes, upon incisions being made into them, a milky juice, which has a considerable resemblance to the juice of the poppy. This*

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\* From Thrydax a Lettuce.

milky fluid has been collected and submitted to experiments by Dr. Duncan of Edinburg. and by him called Lactucarium. From the trials made with a solution of it, both on himself and others, he has no doubt that it is possessed of Anodyne properties, and may be used as a substitute for opium. It is well adapted to persons who from idiosyncrasy, or delicacy of habit, cannot employ opium without experiencing distressing consequences.

The Anodyne properties of Lettuce were very early known. Galen, who in the decline of his life suffered from wakefulness, found much comfort in eating a lettuce in the evening, and any one who has indulged in the use of the plant must have experienced the same effects. Celsus also mentions its soporific powers.

*Chemical Analysis.*—Water dissolves 50 per cent. in 100. This consists of mucus, and the Narcotic principle of the preparation whatever it may be. The other constituents are wax, resin, caoutchouc.

Caventou and others have examined it expressly with the view of obtaining morphia from it, but could procure none. The Narcotic principle of Lactucarium is still unknown.

*The method of preparing it.*—The plant is allowed to shoot up until the top of the stem is about a foot above the surface of the ground. The stem is then cut off about an inch from the top, and from this a milky fluid soon flows. This forms a black or dark colored incrustation over the surface where the stem was cut off. As this cannot be removed by scraping, Dr. Duncan simply cuts off a thin cross slice of the stem to which the dark colored matter adhered. This is thrown into a wide mouthed phial containing spirit of Wine diluted, by which the incrustation is dissolved, and the spirit possesses the color and taste of laudanum. In this manner a saturated solution may be obtained, which can be brought into a dry state by evaporating the spirit. In this state it is darker than opium, but has the odor and taste of that article, attracting powerfully the moisture of the atmosphere.

The dose of Lactucarium is from ij. to iv.—and gradually to x. and xv. in pills.

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*Family Solanææ—Hyosciamus Niger, or Black Henbane.*—This plant is a native of Europe, yet is to be found in many parts of our country.

*Description of the Plant.*—Root biennial, fusiform, whitish.

Stem, one to two feet high, stiff, round, branching.

Leaves sessile, sinuated by large acute unequal teeth, nerves thick and branched.

Flowers. forming unilateral rows on the branches, as may be seen by the persistent calyces which remain.

Locality, Northern and Eastern States, unknown in the South.



The whole plant is glaucous, hairy, glutinous, and has a fetid smell.

Every part of the plant is active, the root even more so than the leaves, though the last are the only part used. They afford a juice which possesses their Narcotic power, and which, inspissated, forms the extract of shops, the preparation commonly used.

The leaves when fresh have a slightly fetid smell and a mucilaginous taste, which properties are lost upon being dried, and the Narcotic power is also impaired.

The roots are stronger than the leaves, but as they vary in this respect, they are seldom used. They have a considerable resemblance to the root of the parsnip, and from this circumstance very fatal mistakes have sometimes happened. In a case cited by Wepfer in Bigelow's Botany, the monks of a whole monastery, in consequence of some roots of this plant being boiled with other vegetables for their food, were seized with raving delirium, accompanied with intense thirst, impaired vision, and other violent affections. Other cases might be cited of the same violent effects being produced.

In its medicinal operation upon the system, it bears a greater analogy to opium than any other Narcotic. In a moderate dose it excites the action of the heart and arteries, which is followed by diminished sensibility and motion. In a still larger dose it occasions headache, diminution of sensibility, stupor, delirium, impaired vision, and a condition of the cerebral system bordering upon apoplexy; and in a fatal dose these symptoms are all aggravated, with convulsions, distortion of the countenance, a weak, tremulous pulse, and an eruption of petechial spots on the skin. The stomach, in these cases, has been observed to exhibit marks of high inflammation, with dark and gangrenous spots on the surface.

*Medical Uses.*—From its close analogy to opium, it is not surprising that it should have been introduced into the practice of medicine, and it appears that it has been employed both in ancient and modern times. It, however, fell into disrepute, or was overlooked, until its use was revived by Baron Storck of Vienna, who introduced it, with several other Narcotics, to the notice of practitioners. The Hyosciamus is principally resorted to as a substitute for opium, where that article disagrees, or is contra-indicated by particular symptoms. Possessing the Narcotic without the constipating qualities of opium, it may be employed in many cases where we wish to avoid costiveness. It is, therefore, resorted to in these cases with good effects.

The Hyosciamus has been much recommended in the diseases of the nervous and spasmodic character, as well as in mania. In spasmodic asthma it is highly spoken of by Dr. Bree, and a tincture of this article has been recommended in hooping cough.

Besides these diseases, it has been given in colic, particularly colica pictonum, in which it was found efficacious by Stoll and others; also in rheumatism, hysteria, and some puerperal complaints—but in these cases it will never take the place of opium.

Externally it forms a useful application in various topical diseases, as in scirrhus, and cancerous affections, and in scrophulous ulcerations. In these cases, it is employed in the form of cataplasm of the bruised leaves, or as a wash.

Internally it is employed in the form of Extract of the leaves, in the dose of one or 2 grs. gradually increased, until its operation becomes sensible.

From one grain, the dose of the Extract may in some cases be gradually increased, until as much as ℥i. or 3ss. of it may be taken in the course of the day. Dr. Cullen says, he seldom found the soporiferous or anodyne effects appear until he had proceeded to eight or ten grs., and that he often found it necessary to go to 15 or 20 grs. The Extract must have been of a very bad quality; such doses could not be supported.

*Tincture of Hyosciamus.*—Prepared by macerating five ounces of the leaves of Henbane in two pints of proof spirits for 14 days. The Tincture is usefully combined with other articles, as follows:

Tinct. Hyosciamus, ℥i.

Camphor. Mixture, ℥i. to ℥ii.

Tinct. Humul. Lup., 3ss. to ℥i.

Comp. Tinct. of Cardamom, a few drops—m.

For a draught.

The Tinct. of H. is employed with advantage in that state of irritable bladder, and urethra, which accompanies the inflammatory stage of gonorrhœa.

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*Family Solanææ—Datura Stramonium—Thorn Apple.*—This plant grows very generally throughout the United States. Whether it is a native of these States. or an exotic, is a question which has not been settled by the botanists. It is an annual plant, and grows upon the borders of roads, around houses, and in gardens, delighting in a rich soil, and is known by a variety of names, as Jamestown Weed, Stink Weed, &c.

It is undoubtedly Narcotic, and exhibits all the usual effects of articles of this class in a very considerable degree.

Every part of the plant, when recent, has a strong, heavy, disagreeable odor, and a bitter, nauseous taste.

Taken internally, it proves a violent Narcotic poison, affecting the mind and body in the most powerful manner. Its usual consequences when swallowed in considerable quantity, are vertigo, and confusion of mind, insensibility of the retina, occasioning dila-

tation of the pupil, and loss of sight, tremors of the limbs, headache, dryness of the throat, anxiety, and faintness, and sometimes furious delirium.

If the amount taken be large and not speedily ejected from the stomach, the symptoms pass into convulsions, or lethargic stupor, which continue till death.—*Bigelow's Med. Bot.*

Being thus powerful in its effects, instances of which are not uncommon, it may, when taken in small doses and under proper regulations, prove a remedy of importance, and a useful agent in the hands of physicians.

The internal use of Stramonium, as well as that of several other deleterious plants which I have mentioned, were first ventured upon, and recommended by Baron Storck, who employed an Extract of the expressed juice of the plant with advantage in several diseases, viz. mania, epilepsy, and some other convulsive affections.

Much has been said of the utility of this medicine in mania, both in this country and Europe, but the cases to which it is best adapted are not accurately discriminated.

In Epilepsy, however, it has been most celebrated, and particularly in those cases in which the convulsions give warning of their approach, or occur at regular periods.

It is so rarely employed at the present time, that I need not enter into the particulars of its application.

In Spasmodic Asthma, the smoke of the Stramonium has been recommended, but as usually happens with all new remedies which are introduced, much contrariety of opinion exists; some extolling them for powers which they do not possess, while others deny them all virtues. Such has been the case with the application of the Stramonium to the disease last mentioned, and after undergoing various fluctuations in opinion, its real value seems better ascertained and more generally admitted.

The smoke of the Stramonium was first considered a specific for relieving the paroxysm of Asthma; and when the first notice of its utility was published, it was applied to most cases of Dyspnoea, however originating, but from too indiscriminate employment it fell into much disrepute, and even did mischief. The testimony of several distinguished physicians is favourable to its use in Spasmodic Asthma.

The roots of the plant cut into slices, dried, and then bruised, are directed to be used; but the stem and leaves are also employed. They are cut into small pieces and put into a common tobacco pipe. The smoke is directed to be swallowed, and the saliva produced by the smoke. When thus employed, speedy relief is often obtained. Several cases may be cited from authors of its good effects.



Dr. Bigelow speaks in high terms of the good effects of smoking the Stramonium in attacks of this disease, and says that it would not be difficult to designate a dozen individuals in Boston and its vicinity, who are in the habit of employing it with unfailing relief in the paroxysms of this distressing disease. The effects, from my experience, are very variable; sometimes much relief has been afforded by its use, and at others very little or none.

It is only in the pure forms of Spasmodic Asthma that it is effectual. When the difficulty of breathing is connected with a phthisical habit, or an effusion of serum in the lungs, or upon the presence of exciting causes in the first passages or elsewhere, it would not be found to afford relief, but often injury would arise from its use. Neither should it be employed where there is the slightest tendency to apoplexy, epilepsy or paralysis.

Besides these diseases, Stramonium has been resorted to in several other Chronic affections. It is stated, that this article has done more to lessen the violent pains of several chronic diseases, than any other Narcotic substance. Its effects are to lessen powerfully, and almost immediately, sensibility and pain, and to relax rather than to constipate the bowels, and to exert little soporific effect except that produced by the succession of ease after pain.

These complaints were Chronic Rheumatism, Sciatica, Tic Douloureux, &c.

In Chronic Rheumatism it has for a long time past been employed, and the testimony in its favor is very considerable. In cases of this disease attended with an irritable, quick pulse, much swelling of the joints, and pain upon being moved, it has been employed with much advantage.

In Sciatica decided benefit was obtained, and especially when it was connected with syphilitic pains—and it has also been employed in scrophulous, venereal and other ill conditioned ulcers.

I have on several occasions tried the Stramonium in the form of Tincture in considerable doses in several painful diseases, and certainly with very inferior effects to those afforded by the preparations of opium, and I do not hesitate to confine myself to them almost exclusively. When, however, there are particular idiosyncrasies forbidding the use of opium or its preparations, I prefer the Stramonium to the other Narcotics.

*Of the External Application of Stramonium.*—The external application of this article is of much older date than the internal. So early as 1593 the juice of this plant boiled with lard is mentioned by Gerarde as a useful application to inflammatory tumors, scalds and burns, and it is stated that cures were effected in a short time. It is still employed in these cases and with considerable advantage in irritable ulcers, with a thickened edge and a sanious discharge, being found efficacious in changing their condition, and promoting the

granulations, and cicatrization. The same preparation has also been said to be a useful application for rheumatic pains.

The leaves steeped in brandy forms a good embrocation for rheumatism, and boiled in milk have been used in gout with great relief.

In painful Hemorrhoidal Tumors the Ointment of Stramonium mixed with that of the Acetate of Lead, gives in many very prompt and considerable relief, and may be considered an application little inferior to any employed.

The forms in which this article is prepared for use, are the Powder, the Inspissated Juice or Extract, the Tincture, and Ointment.

In preparing the Powder, the leaves should be collected when the plant is most vigorous, and when dried and pulverized, be kept in close stopped phials.

The seeds are also powdered, and should be collected when they are dry.

The Inspissated Juice or Extract is made by compressing the bruised leaves in a strong bag, until the juice is pressed out. This is to be evaporated in flat vessels at the heat of boiling water to the thickness of honey, which is afterwards evaporated to the proper consistence.

An Extract may also be made from the seeds by boiling a pound of the seeds in a gallon of water for several hours; the seeds are then taken out, bruised and returned into the water; they are then boiled until the water is reduced to 4 pts., strained while hot, and evaporated to a proper consistence.

The Tincture is made from the leaves and seeds in the proportion of an ounce of either to  $\text{z}\text{v}\text{jii.}$  of proof spirit.

The Ointment by simmering a pound of the leaves in 3 lbs. of Lard until the leaves become crisp; it is then strained and cooled gradually.

In using the Stramonium, we should always commence with small doses, and increase until some sensible effect is produced either in the head or stomach.

The dose of the Powdered leaves is 1 grain.

Of the Powdered seeds  $\frac{1}{2}$  a gr.—of the Inspissated juice or ext. 1 gr.—of the Extract from the seeds  $\frac{1}{2}$  a gr.—of the Tincture from 15 to 20 drops.—*Bigelow's Med. Bot.*

The pods of the Stramonium, and the leaves, are sometimes eaten by children, and alarming consequences often ensue, instances of which many practitioners could relate.

The symptoms which are commonly produced, are dilatation of the pupil, vertigo, delirium, tremor, or torpor, and loss of sensibility, slow pulse, the eyes fixed, and expressive of great wildness. When these symptoms come on suddenly, the child having been

previously well, we may generally suspect that some deleterious substance has been taken, and our suspicions may often justly be directed to this article.

The treatment will consist in evacuating the stomach with an active emetic, which in most cases will be sufficient, but if it is not, it must be followed up with cathartics, and other means of evacuating the Alimentary canal. Should these not succeed, other measures must be resorted to, such as have been mentioned when an over dose of Laudanum has been taken.

The seeds of the Stramonium, I should have observod, are more active than any other part of the plant—the active principle depending on an alkaloid called Daturine.

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*Family Solanæe—Atropa Belladonna—Deadly Nightshade—*Is said to be the most powerful of the Narcotics.

It is a native of Europe, growing in great abundance in Italy. The plant flourishes in shady places, and is cultivated in gardens, though to very little extent in this country. The whole plant is possessed of poisonous properties of the Narcotic nature, and the berries which it bears resembling cherries, furnish us with many instances of their fatal effects, particularly upon children, who are readily tempted to eat of them, by their alluring appearance and sweet taste.

The symptoms which follow their being taken into the stomach commence within a very short time, and are extremely violent. These are thirst, a dry mouth, trembling of the tongue, anxiety about the Precordia without the power of vomiting, delirium, retching, convulsions, and other nervous symptoms. Death ultimately terminates the sufferings of the patient, when the body rapidly putrifies, emitting a peculiarly unpleasant odor. On dissection, inflammation has been discovered in the intestines, mysentery, and liver, and mortification to have supervened. Similar effects will result from a over dose of the leaves or extract.

*Medical Uses.*—The leaves of the Belladonna were first used to discuss scirrhus and cancerous tumors, and also as an application to ill conditioned ulcers. Their good effects in this way, at length induced physicians to employ them internally for the same purposes, and we have a considerable number of apparently well authenticated cases which prove them a very serviceable and important remedy.

But though cases may be adduced of the good effects of the Belladonna in scirrhus and cancer, its reputation, in my opinion, does not rest upon stronger grounds than the Cicuta.

It has also been recommended in several of the Neuroses, as epilepsy, chorea, tetanus, &c.—but it is now conceded pretty generally, that it is not very efficacious, and that the praises bes-



towed upon it in these and the Comatose affections were also unfounded.

In Mania its utility has been recommended by Mr. Blacket, and cases are related of its beneficial effects.—*London Med. Rep.* 1823.

There is in these cases, however, so much doubt of any decided benefit having been obtained from the internal use of this article, while its occasional mischievous influence is so sudden and unmanageable, that much difference exists as to the propriety of its administration, and I believe that it is now seldom or ever resorted to.

The Belladonna has been much recommended in the complaints of the eyes. From its effect in dilating the pupil, it may be made subservient to valuable purposes in that state of the Lens, denominated Cataract.

The application of it to the eye in Cataract, affords a certain test whether the iris adheres to the capsule of the Lens or not. For by using the article we can make the examination with much greater accuracy than by the former mode of shutting and opening the eye—because, in this way, we must examine quickly and in a dull light, whereas by the use of the Belladonna we may do it with the greatest deliberation, and in the brightest light.

It proves a palliative remedy in common Cataract, by causing such a degree of dilatation of the pupil as is favorable for the vision of such patients in a greater degree, and in the bright light of day. In these cases, where the margin of the Lens is transparent, the use of this article, by enlarging the pupil, is productive of these happy consequences. As the effect of its application gradually declines, the use of it must be renewed 3 or 4 times a day, at each time dropping two drops, from a quill, of a solution made with a dram of the extract, to  $\text{ʒi.}$  of spirit, or water, upon the ball of the eye. The effect commences in half an hour afterwards. It has been so efficacious in some instances as to render the operation for Cataract unnecessary. It should be observed too, that this article does not loose its effects by repetition.

The application of the Belladonna facilitates the operation of extraction for Cataract, by allowing the Lens to pass through the dilated pupil, thereby removing the delay sometimes occasioned by the contraction of the iris, and lessening the danger of inflammation taking place in that membrane.

The Belladonna may also be made to produce the effect of dilating the pupil, by anointing the eyelids with a little of the extract made soft with water.

Such are the chief uses to which this article is applied.

Besides the diseases mentioned, the Belladonna has been introduced to our notice as an article capable of preventing, or at least moderating the violence of the symptoms of Scarlet Fever.

This discovery was made in Germany in the year 1807, and since that time the physicians of that country have had opportunities of satisfying themselves in the most satisfactory manner, of the efficacy of this article in the above particular.

It would seem that the most intimate contact with patients affected with Scarlatina is harmless to those who have used the preservative in time, and even in those cases where they have had recourse too late to prevent the effect of the contagion, it moderates in a singular manner the malignity of the disease.

Among the German physicians who have tested this property, is Dr. Berndt of Custrier. This practitioner during the epidemics of Scarlatina which appeared in that city in 1818 and '19, had recourse to this plan with much success. He administered a Tincture of Belladonna to children from the age of one to 15 years, the period in which they are most susceptible of the contagion, and after a month or more of the Prophylactic treatment during the rage of the epidemic, he had the satisfaction to find that of 195 children who had been exposed, only 14 were attacked with the epidemic, and that in these, the symptoms were much more mild than in the ordinary course of the disease.

The efficacy of this article has been tested by other physicians of Germany, and the result the same.

The Tincture is prepared in the following manner:

R. Ext. Belladonna zii.—Cinnamon Water zii.—m.

The dose is from one to twelve drops according to the age of the individual 4 times a day—and continued during the existence of the epidemic. The practice has not been fairly tested with us; the disease seldom appearing in an epidemic form.\*

The activity of the Belladonna depends upon an alkaloid principle called Atropia. It is prepared by saturating with potash a strong decoction of the leaves of Belladonna, slightly acidulated with sulphuric acid—a precipitate of atropia falls down possessed of properties resembling morphia. It is an alkali sparingly acted upon by the usual solvents. We must again re-dissolve, and pre-

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\* *Prophylactic property of Belladonna.*—At Monastir, in 1829, scarlatina raged, both among our troops and the inhabitants of the towns and villages where we were quartered. The grand vizier, who had expended much time and money on the discipline of this his favorite *corps d'armee*, gladly accepted the proposal of Dr. Oppenheim to try the effects of belladonna. As the troops were generally very young men, and totally unaccustomed to narcotics, the dose he gave was comparatively small; thirty-six grains of the extract of belladonna were mixed up with one pound of the extract of liquorice, and ten grains of this were given morning and evening to each soldier. The success of the experiment far exceeded his most sanguine expectations, for not more than twelve men, out of twelve hundred, sickened after this plan was adopted; of these twelve, six died, and it is to be remarked, that the disease continued unabated among the inhabitants where the soldiers were quartered, after it had ceased among the latter, although they lived in the same houses.—*Edinburgh Phil. Jour. and Monthly Archives of the Medical Sciences.*

cupitate the atropia again and again, before it can be obtained perfectly pure.

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*Solanum Dulcamara*—*Bitter-sweet*—*Woody Nightshade*.—This plant is a native of Europe, but has been introduced into our country, where it is found growing abundantly. The most luxuriant specimens are found about brooks and ditches, and in sheltered situations, where the roots have free access to water. It is also to be met with under the eaves of houses not inhabited, or other sheltered situations.

The roots and stalks upon being chewed first cause a sense of bitterness, which is soon followed by a sense of sweetness, and hence the plant has obtained the name of Bitter-sweet.

The stipites or younger branches are directed for use, and they may be employed either fresh or dried—making a proportionate allowance in the dose of the latter, for some diminution of its power by drying.

In autumn, when the leaves are fallen, the sensible qualities of the plant are said to be strongest, and on this account it should be gathered in autumn rather than spring.

The decoction of these stalks operates both as Narcotic and Diuretic. In very large doses it produces the usual symptoms of the Narcotic poisons.

Of the forms of its exhibition and doses it is unnecessary to say a great deal, as it is a remedy very rarely employed. It has chiefly gained celebrity as an article in diet drinks, in certain cutaneous diseases, as herpes, lepra, scabies, and some of the secondary forms of syphilis.

The mode of employing it is to boil an ounce of the stalks in a pint and a half of water to a pint—strain when cold. Of the decoction, the patient is to take  $\mathfrak{z}\text{ii}$ . three times a day, but the quantity may be increased to a pint a day. The skin is to be washed with a decoction of the same, made stronger, and it proves a good auxiliary.

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*Family Umbellatæ*—*Conium Maculatum*—*Cicuta or Hemlock*.—This article is nearly allied to the hyosciamus in its general properties, possessing all the characters which belong to the articles of this class, though not in the most powerful degree. It is a native of Europe, but is now very common in this country, and flourishes well about road sides, and waste grounds, especially in those parts which have been longest settled.

*Description of the Plant*.—Flowers umbellate, with many leaved involucre.

Leaves smooth, decomposed, two or three times pinnate.



Stem 2 to 4 feet high, branched, striated, hollow with oblong, purplish spots.

The distinguishing characters of this plant, are its strong smell, spotted stems, parsley leaves.

*Locality.*—Native of Europe, but naturalized in New-England, and as far South as Virginia—grows in old fields, near roads and fences, on the banks of rivers.

The whole plant is applicable to medicinal purposes except the root, readily yielding a quantity of juice upon pressure, which when inspissated by evaporation, affords a brown extract, and with the dried leaves form the only Pharmaceutical preparations in use.

Conium was well known to the ancients, at least a plant bearing this name has been described as a poison from very remote antiquity, it being employed by the Athenians as a mode of inflicting punishment upon criminals condemned to death. It was probably with the juice of this article that Socrates and Phocion yielded up their lives to the unjust and cruel decree of the Tribunal of the Areopagus. It has, however, been doubted whether this was the plant used, as death produced by it would have been attended with more violent symptoms than those which were described as occurring in the case of Socrates—Plato having represented it as easy and tranquil, and that he retained his senses to the last.

Although the poisonous qualities of this plant were long known, yet it was never applied to medicinal purposes until the experiments of Baron Storck in 1760—to whom the credit is justly due of having brought it into repute in a work published about that year—and its subsequent introduction into our Pharmacopeias. Although the use of this plant has not answered by any means the sanguine expectations which practitioners were led to entertain from the writings of Baron Storck, yet it must be admitted that in several very formidable and hitherto intractable diseases, it is still found to possess very valuable qualities.

As a remedy for Cancer, which disease it was extolled as curing, subsequent experiments have proved the very slender foundation upon which its reputation rests as a remedy—though it allays several distressing symptoms—mitigating pain for a time, diminishing the ulcerative process, and changing the discharge, which from being thin, ichorous and offensive, becomes better in respect to color and consistency.

The experience of modern physicians, particularly of M. Alibert, who tried it in more than one hundred cases in the Hospital of St. Louis, has pretty well established the fact, that it is wholly incapable of curing either this disease or scirrhus of the genuine or confirmed kind—though as a Palliative it is entitled to much attention.

It has this advantage over opium, that in its most favorable operation, it alleviates pain without occasioning sickness or headache, and often without producing a greater tendency to sleep, than what belongs to the mere effect of the suspension of pain, in harassing and chronic diseases—so that it becomes a valuable substitute for opium, the good effects of which it secures, without occasioning the inconveniences inseparable from this valuable medicine.

It is not always that it operates so favorably—frequently it produces no effect at all except nausea, and sometimes such distressing symptoms follow its use, that it must be discontinued.

Besides its internal use, the leaves are employed externally to painful and extensive sores of a cancerous nature in the form of a poultice, or warm fermentation, in which cases it often affords considerable ease, and changes the nature of the discharge from a thin, fetid sanies, to a healthy pus. The good effects from this application, seem to depend in part, upon the Narcotic quality of this plant, and partly upon the soothing influence which is exercised by most fresh vegetables.

In Scrofulous affections it has been more beneficially used, than in the preceding cases, and this, whether the disease appears in the form of tumors or ulcers. In these cases its utility is much increased by being united with minute doses of mercury, and employing the article externally.

In Ophthalmia occurring in scrophulous habits, Cicuta has afforded more relief than any of the articles commonly employed, as bark, mild mercurials, sea water, &c. Great constitutional irritability attends, with extreme sensibility to light, insomuch that the feeblest ray can scarcely be borne—and the utmost care is necessary to exclude it entirely. By persevering in the use of Cicuta, commencing with small, and gradually increasing to large doses, much relief will be experienced, and with the removal of the ophthalmia, the general health will be found much improved, and the enlarged glands in various parts of the body considerably reduced.

In Ulcerations of the secondary stages of Syphilis, as well as ulcers of a morbidly irritable character, it has been used in large doses, and it appears to be a remedy from which we may expect very important advantages.

In some other forms of disease, as Cutaneous affections, Chronic Rheumatism, Asthma and Pertussis, it has been recommended, but its efficacy in these diseases is not very remarkable, and I believe they may be more effectually managed by pursuing other modes of treatment.

In some of the Neuroses it has been much celebrated, but more extended experience has convinced us, that many of these complaints originate in states of the system widely different from what was suspected, and yield to a more appropriate treatment.

In *Tic Douloureux*, a very painful and distressing form of nervous disease, its reputation is supported upon such creditable authority, that it would be unpardonable to pass it by unnoticed. In the 2nd vol. of the *New-England Journal*, a number of cases are detailed, in which perfect relief was afforded by the Hemlock given in large doses, and increased rapidly, until a decided effect upon the system was felt. It is directed to begin with a single grain of the extract, and to increase to 5 grs. for the second, or third dose, and afterwards to add 5 grs. to every dose, until a full effect is felt upon the system. Thus administered, it has been found more successful than, perhaps, any internal medicine which has been tried.

From the utility of *Cicuta* in Glandular Obstructions, it has been recommended in jaundice and amenorrhœa. Dr. Fisher, of Boston, in a paper on the Narcotic vegetables, bears unequivocal testimony in favor of this article in the former complaint. He was first induced to employ it with a view to its relaxing effect in facilitating the passage of Biliary Calculi. Afterwards it was given by him to many icteric patients, and with the exception of three complicated cases, it never failed in his hands, or within his knowledge, to remove the disease. The efficacy of this article is supported by the authority of several other distinguished physicians of our country, and it is considered capable of effecting a cure of such cases as are susceptible of relief from medicine.

*Cicuta* has advantages over opium in relaxing spasm of the Biliary ducts producing Jaundice, since it does not disorder the secretions of the Liver, which opium often does, thus adding another evil to the injury which already exists.

Of late, this article has been applied to correct an inordinate secretion of milk. The secretion of milk is, in some cases, continued in a great degree, after the usual time for its disappearance. When the secretion continues beyond the usual time, it is productive of inconvenience, and even disease, by the irritation its presence produces—and further, the system is prevented from returning to that state, upon which depends the recurrence of menstruation and pregnancy. To lessen the secretion, various active remedies have been employed, as brisk cathartics, astringents, mineral acids, and of late, some remarkable cases are recorded of the efficacy of *Cicuta*.

I might enumerate various chronic diseases in which *Cicuta* has been recommended. Subsequent experience has by no means realized the sanguine expectations which were formed of its value, in several of the most formidable and hitherto incurable cases in which its use was celebrated, and it would be an unnecessary consumption of your time. The diseases I have mentioned are those in which its efficacy is well supported, and it



remains for me to speak of its preparation and manner of administration,—objects of very great importance.

The whole of the plant appears to possess the same power of affecting the human body, so that this power resides in the common juice which pervades it. The part actually employed in medicine is all above the root, and as the plant is very succulent, it readily yields a considerable quantity of juice upon strong pressure, which, when gradually inspissated by evaporation, affords a brown extract.

The leaves are to be gathered when the plant has acquired its full vigor, and is rather on the verge of decline. Just when the flowers fade, and the rudiments of the seed become observable, and the appearance of the plant inclines to a yellow color, seems to be the proper time to collect them. The plant being cut, is carried to a press, where the juice is squeezed out, and as fast as it runs out of the press, it must be put over the fire to be boiled, until three parts in four of the whole liquor is evaporated. It is then removed to a water bath, and evaporated to the consistence of honey. It is then spread thin on a board or slab, and exposed to the sun and air—when it soon acquires a proper consistence. Thus obtained, the extract is of a *dark green* color, almost black, of a strong, disagreeable smell, and a slight pungent taste, without bitterness. With all the care we can take, the extract becomes materially impaired in a few months, so that those who are in the habit of employing it, should always provide a fresh stock every year.

In employing the extract, we should begin with small doses, and increase it by degrees every day, until the system becomes sensibly affected by its use. These effects are different in different constitutions.

They consist generally in giddiness, a slight sickness, and a trembling of the body. One or all of these symptoms are the marks of a full dose, let the quantity in weight be what it will. When these effects are produced, the medicine must be discontinued until none of them are felt, when it may be resumed. To be productive of any beneficial purposes, it must be given to as large an extent as the constitution will bear.

In administering the Cicuta, we should begin with doses of two grains three times a day, increasing a pill each dose. Given in this manner, it promotes rest and eases pain, seldom creating thirst, or that kind of morning head-ache which often succeeds the use of opium. Gradually increased in the manner I have mentioned, patients will at length take 20, 30 or 40 grs. 3 times a day; but whatever the quantity be, it must be pushed to the extent of affecting the system in the manner mentioned.

In commencing with a new supply, it should be observed par-

ticularly, that the same doses will not be proper as those employed with the former parcel, for no two parcels agree exactly in strength: 20 grs. of one extract have been equal in point of efficacy to 30 and even 40 grs. of another—so that to avoid any unpleasant consequences, we should, with a change of the article, change our manner of giving it, and return again to the original small doses.

The leaves dried and pulverised, is another form in which the *Cicuta* has been employed. They have been said to be more uniform in their operation, and less liable to spoil by keeping than the extract. The powder should be kept in closely stopped phials, and excluded from the light, and it should be given in the same manner as the extract.

It is probably often owing to inattention to the preparation of the plant, and the small doses which are employed, that we have to complain of its failure, in its application to diseases.

The treatment of persons poisoned by the use of this article or any other Narcotic, is pretty similar to what has been pointed out. It should consist in the speedy evacuation of the substance from the stomach. Of the emetics, the sulphate of zinc is the best on account of its being more quick in its operation.

After the stomach has been cleansed, a cathartic should be administered, and to lessen the effects of the Narcotic upon the system, lemon juice or vinegar or strong coffee are to be employed. As most Narcotic poisons act by destroying the functions of the brain, respiration being suspended because it is under the influence of that organ—life may be preserved, according to the suggestion of Mr. Brodie, by keeping up artificial respiration, after death has apparently taken place.

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*Cicuta Maculata*.—Nearly allied in structure and effects to the preceding, is the C. M. or American Hemlock. The common name by which it is known is Snakeweed. It inhabits wet meadows, and banks, from the Northern to the Southern limits of the U. S., flowering in July and August.

The root of this plant is composed of a number of large, oblong, fleshy tubers, diverging from the base of the stem, frequently being found of the size and length of the finger. The root is perennial, and has a strong, penetrating smell and taste.

The stem grows to the height from 3 to 6 feet. It is smooth, branched at top, hollow, jointed, striated, and commonly of a purple color, except when the plant grows in the shade, in which case it is green.

The leaves are compound, the largest being about three times pinnate, the uppermost only ternate. The flowers grow in umbels of a middling size.

The roots of this plant have been mistaken by boys for those of

other plants, as the angelica, life of man, &c.—and when eat, have produced symptoms of poisoning. These are vomiting, stupor, dilatation of the pupil, great paleness, general distress, convulsions, and, in some instances, death.

Since the discovery of its Narcotic properties, the *Cicuta* has been used in small doses as a substitute for the *Conium*. Its effects are very analogous to those of the true Hemlock as far as they were observed, but more powerful. In a large dose it produces nausea and vomiting.

The diseases in which it may be employed, are the same as the preceding—and the extract is prepared in the same manner.

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I shall next call your attention to one of the most powerful articles the M. M. affords. I mean the Prussic or Hydrocyanic Acid. It is more extensively diffused throughout nature than we should at first have supposed, being found in many vegetable productions.

It is obtained in considerable quantity from the leaves of the cherry and other species of laurel, from the bitter almond, peach blossoms, and the kernels of different fruits. These vegetable substances were long known to exert an unfriendly influence on the human system. To what this was owing, has been only ascertained since the discoveries of modern chemists, and from the close resemblance between the Prussic acid obtained from other substances, and from the vegetables enumerated, its identity has been inferred. To this, therefore, is referred the pernicious influence which they exert upon the human system. From them it can be obtained by distillation, as it is of a volatile nature and rises with the water.

From the cherry laurel it is obtained by distillation in considerable quantity, and when given to animals in the dose of a wineglassful, it extinguishes life without a struggle. In a more moderate dose, it produces convulsions, tetanus, and all the effects of the Narcotics.

For medicinal purposes, Prussic acid is not generally obtained from the vegetable kingdom, but prepared in a manner which will be detailed to you by the Prof. of Chemistry.

In its greatest purity it is limpid and colorless, with a pungent, suffocating odor, resembling when much diluted the smell of bitter almonds, or of peach flowers.

The acid obtained according to the directions of Gay Lussac, which is almost pure, is a very active poison, so energetic as to be really frightful even to those who are accustomed to witness the effects of poisons. The extremity of a glass tube dipped into a phial containing some pure acid, was plunged into the throat of a dog. The tube had scarcely come in contact with the tongue,



when the animal made two or three long and rapid inspirations, and fell dead.

An atom of the acid was applied to the eye of another dog; the effects were as sudden, and as fatal, as in the preceding experiment. A drop of the acid diluted with four drops of alcohol, was injected into the jugular vein of a third dog. The animal fell dead that instant, as if struck by a cannon shot or by lightning. In short, the pure Prussic acid prepared according to Gay Lussac's method, is without doubt, Magendie observes, of all known poisons, the most active and the most promptly mortal.

It is even stated to be impossible to breathe its vapor without feeling the most dangerous effects, producing great uneasiness in the chest, with prostration of the muscular and nervous energies.

Poisonous as it is, there is no doubt but that the acid when it is properly diluted with water, may be used as a medicine with safety. In this state, it may be given to the extent of 30 or 40 drops, without producing any serious inconvenience, and the pretty frequent use made in cookery of the laurel water and the bitter almond, proves that it may be introduced into the stomach when properly diluted.

The medicinal Prussic acid, a name which has been given to the acid when so largely diluted with water as to render its internal exhibition safe, is prepared according to the directions of Scheele, Vauquelin, Brande, &c. When employed with the precautions I shall mention, it will be found to be perfectly innocent—and may be given even in large doses when administered with prudence. In its operation on the system, it is evidently sedative—and when exhibited to a patient laboring under protracted illness, it appears to exert an immediate influence over the nervous system—it gradually diminishes all irritability—checks a too rapid circulation, and calms many of the symptoms of fever. From this operation there is a relief from pain and actual suffering—sleep comes on undisturbed—respiration is soft, and the pulse more quiet than at other periods of the complaint, having lost the thumping beat which characterises irritation.

With a knowledge of the operation of this acid upon the nervous system, Magendie was led to believe, that it might be employed advantageously, in cases, where the disease seemed to be connected with a considerable increase of sensibility and of irritability. Accordingly, when diluted with water, it has been advantageously used for the cure of nervous and chronic coughs, particularly those attacking young females—in catarrhal affections, and in hooping cough.

Dr. Fontanelles thus expresses himself upon the subject of the latter disease. I have obtained wonderful results from the acid, prepared according to the process of Scheele, upon 4 children of

the same family affected by the whooping cough. I put 3 drops of the acid into  $\frac{5}{8}$  of distilled water, and caused this mixture to be given every 2 hours by a spoonful at once. The effect was, that they slept well, did not experience those paroxysms of cough which threatened to suffocate them—and in a few days the complaint wholly disappeared. Dr. Granville speaks in terms equally favorable of the medicine, and says that the disease need never continue longer than 8 or 10 days, if it be timely and cautiously administered.

From its efficacy in the above affections, its use has been extended to the treatment of the cough, and other symptoms which overpower the unhappy consumptive patient, and to suspend the progress of pulmonary consumption. Magendie has employed it in these cases, and he states that it has been found beneficial in diminishing the frequency of the cough, rendering the expectoration more easy, and procuring the patients some sleep at night, without any colliquative sweats.

These effects were most distinctly and satisfactorily obtained, as the remedy was employed in the incipient or early stages of the disease.

Dr. Granville, in England, mentions cases of advanced consumptive patients, in whom the Prussic acid produced sensible amelioration, but without effecting a cure. He relates 2 cases, which exhibited many of the symptoms of confirmed phthisis, as worrying cough, emaciation, frequent pulse, night sweats, debility, purulent expectoration, as having been cured by the use of the medicine.

Several other cases are cited, of patients afflicted with hectic fever, and sympathetic cough, who were greatly relieved and some of them cured.

The Prussic acid has been employed in this country, and by several physicians of our city, but I fear from these trials that its powers have been overrated, as the same conclusions have not been warranted. In several cases of phthisis it did not appear to exert the least control over the disease, nor were any symptoms alleviated by it.

When judiciously and cautiously exhibited in the early stages of phthisis, by its sedative operation, as well as by allaying the cough, we may hope to check the progress of that inflammatory process which destroys the texture of the lungs, and it ought undoubtedly to be employed; but when the tuberculous consumption has fairly taken possession of the individual, this in common with other remedies will fail, and the unhappy patients will pursue the downward progress to the grave. Even here, however, from its operation, it may be of service by allaying irritation, quieting the cough, and lessening the symptoms generally.

It has been administered by the late Dr. Antony of Augusta, in chronic coughs which had resisted a variety of remedies, and in which very alarming symptoms began to manifest themselves, with very great advantage, relief being obtained in a very few days. Several cases are related by him, for the particulars of which I refer you to Chapman's Journal.

In Chronic Catarrhs it may be employed with more confidence of success, but it should not be trusted to alone.

In Asthma this article has been employed. I have in this disease had recourse to it, and with much advantage, after mild antiphlogistic remedies had been used. I was induced to resort to it in a female who had been subjected to attacks of this disease for several years, and in whom the paroxysms were occasionally very severe. Finding that the use of opium was always attended with very unpleasant symptoms, I substituted the Prussic acid, and think that I derived much benefit from its use.

On the principle of allaying irritation, and thereby allowing a slower, and, consequently, more healthy gastric secretion, this article has been employed in dyspepsia. The benefit resulting from its employment in this complaint, has been particularly considered by Dr. Elliottson.

Upon the same principle it has been employed in *arresting vomiting not dependent* upon inflammation. By its use, vomiting which had lasted for months, ceased upon the exhibition of a few doses. The cases of this disease were unconnected with inflammation; it should be observed where this state of the stomach exists, it is more successfully treated by antiphlogistics.

Prussic acid has further been recommended as making other medicines remain upon the stomach, which would otherwise disagree with it, or be rejected.

It has been recommended also in painful and difficult menstruation, uterine hæmorrhage, hæmoptysis, and in nervous diseases; as a substitute for bloodletting in sub-acute inflammations, and for opium and other Narcotics when they cannot be employed.

Prussic acid has recently been brought forward by Dr. Trezevant, of Columbia, as a remedy in Tetanus, and the circumstances under which it was employed, with the effects produced, render it probable that it will be found a very important article in these cases. Its beneficial operation will be best illustrated by a brief detail of the case.—Vide American Journal of Medical Science.

Of the modes of exhibition.—I have observed that the acid prepared according to Scheeles' method, was milder than that obtained by the process of Gay Lussac, but it is also more variable in its strength. Magendie prefers the latter preparation, therefore, and employs it diluted with six or eight times its weight of distilled



water. Thus diluted, it is called the Medicinal Prussic Acid, and is administered in the following manner.

R. Medicinal Prussic Acid, gtts. viii. to x.

Distilled Water, ℥vjii.—simp. syr. q. s.—℥ss. q. s. h.

It is indispensably necessary to use no other than distilled water in all prescriptions with the Prussic acid, otherwise decomposition will take place. With respect to the dose, as the effect of the acid is different in different individuals, it is necessary to begin with a moderate dose; but there is no danger in increasing it, provided its effects are not manifested. The extent to which it may be carried has been ℥ss. in the 24 hours, and even further; but it will not be safe to go beyond this limit.

During the first days of its use, it proves gently aperient.

When the acid produces nausea, vomiting, dizziness, which it will do in some individuals on the first or second day, it is advisable to abandon it immediately, for there is no chance of its ever agreeing with the patient—but such effects are by no means usual.

When the poisonous effects of the acid are produced, the following symptoms take place. Yawning, and irresistible disposition to sleep—vertigo and dizziness of sight. The pulse is found to be rather strong at first, but flags soon after, and becomes either frequent, wiry and small, or slow and vibrating. A paralytic state of the extremities is remarked next—the pupil remains unalterably dilated—the sensibility of the organs of sense is greatly diminished—vomiting and hiccup shortly succeed, life ebbs fast, and becomes at last extinct. In no instances from poisoning from other Narcotics, does death approach so meekly, or so much divested of its terrors.

To prove the powerful operation of this article, I will cite a few cases. Upon the authority of Hufeland, it is stated, that a man about to be taken up as a thief, swallowed an ounce of the Prussic acid in water. He staggered a few minutes and fell. The pulse could not be felt, and there was no trace of breathing. In a few minutes a single and violent expiration took place—and he expired.

M. B., a professor of chemistry, left from forgetfulness, a flask containing alcohol saturated with Prussic acid. A servant girl tempted by the agreeable smell of the liquor, swallowed a glass of it. At the expiration of two minutes she fell dead, as if she had been struck with apoplexy.

The manner in which death takes place has already been described under the article Opium, and the other Narcotics—and the importance of artificial respiration should also be kept in view.

Antidotes.—When an article operates with such tremendous vigor, it is difficult to point out an antidote which shall counteract its effects when taken in such large doses. With the remedies

against the poisonous effects of Prussic acid, we were until lately wholly unacquainted. Hot brandy and water, or camphorated spirits, properly, though sparingly diluted, or oil of turpentine, were thought to be, of all the means, the best and most effective. Of late Dr. Murray has made some experiments with ammonia, as a counter-poison, and they would seem very conclusive on this point;—animals to whom very large doses of the acid had been given, and when the symptoms were verging to a fatal issue, ammonia applied to the mouth on a sponge, and dropped into the mouth, was attended with the effect of immediate restoration. Dr. Murray himself, conscious of the complete power which ammonia possesses as an antidote, took a quantity of the Hydrocyanic acid, sufficient to produce violent headache, stupefaction, &c., but diluted ammonia prevented these effects from taking place.

It was occasionally applied to the olfactory organs, and the forehead was bathed with it.

In the opinion of Dr. Christison, ammonia cannot be entitled to much consideration as a chemical antidote—though it is of the utmost value as a powerful and diffusible stimulant, by which the Narcotism induced is opposed.

Chlorine—combines high chemical and physical properties. By the first, it decomposes the Prussic acid and prevents its doing further harm, while, by its stimulating properties, it contributes to obviate the effects the poison has already induced. The best method of using the antidote, is by inhaling the vapor of its solution in water sufficiently diluted. The chloride of lime in solution may be taken, or injected into the stomach, as much insensibility exists. The best of all remedies is the affusion of cold water, and it should be employed with the remedy last mentioned.

Objections to the use of this article.—These are the uncertainty which exists respecting its precise strength, as prepared for medicinal purposes. For, let it be prepared ever so carefully by the same chemist, and after precisely the same formula, there are circumstances which cannot but influence its properties, particularly its strength. This shews the importance of commencing always with small doses, and increasing gradually, as *two drops* have, in some instances, produced very severe effects, when *twenty* have produced no effect in others.

Another objection is, its extreme liability to decomposition as prepared for medical use, and this is particularly the case if it is mixed with other medicines. To preserve its strength as much as possible, the phials containing it should be closely stopped, and kept in a cool and dark place, as the light aids in its decomposition very strongly—they should be opened as little as possible, and the undiluted acid should by no means be tasted. Every medical

gentleman who uses this article, ought to be acquainted with the manner of preparing it, and to this circumstance I attribute its greater success in the hands of some physicians than others.

Substitutes for the Chemical preparation.

*Family Rosaceæ—Prunus Lauro Cerasus—Cherry Laurel.*—It is a shrub or small tree, sending off long, spreading branches, and covered with a smooth, brown bark.

Leaves evergreen, obovate, rather serrated, of a shining, deep green.

Flowers in spikes.

It is a native of the Levant, and appears to have been long cultivated in Great Britain, where it adds much to the beauty of shrubberies.

The leaves of the P. L. C. have a bitter, styptic taste, accompanied with a flavor resembling that of bitter almonds, or the kernels of the other Drupaceous fruits.

The kernel like flavor which these leaves impart, being generally esteemed grateful, has caused them sometimes to be employed for culinary purposes, and especially in custards and puddings, and as the proportion of this matter of the leaf to the quantity of the milk is inconsiderable, bad effects have seldom ensued.

The Laurel water distilled from the leaves of this plant, and which had been superceded by the preparations of the French chemists, is now beginning to be again employed, being much more permanent and uniform in its strength, and, I believe, equally as efficacious.

The dose is from xxx. to xl. drops.

A Tincture of the Leaves affords often the same results as the distilled water.

Such is the usual mode of preparing and administering the Prussic acid.

To these has lately been added another—obtaining it immediately from the Bitter Almond.

This nut contains, in addition to albumen and mucilage, a considerable quantity of a bland, insipid, inert oil, easily obtained by expression. To these ingredients there is superadded a principle which gives it its peculiar flavor, and which may be obtained by distillation with water. This is called the Distilled Water of the Bitter Almond.

From the cake which remains after the separation of the fixed oil from the almond, there can be obtained, by distillation, a volatile oil, in combination with Hydrocyanic acid.

One hundred weight of the Bitter Almond cake remaining in the press after the separation of the fixed oil, is put into a still, with about 400 gals. of water—this large proportion of water



being necessary to prevent the formation of a mucilaginous magma, from which the volatile oil will not pass off, and which, if brought to boil, rises up into the head and worm of the still. The produce of the oil is liable to much variation—1 cwt. of cake yielding from 2 oz. to  $2\frac{3}{4}$  by weight. It is of a pale, yellow color, very acrid and bitter to the taste, exhaling the odor of the peach blossom, and of a greater specific gravity than water. By digesting red oxyde of mercury with it, Dr. Hennel obtained cyanuret of mercury, from which pure Prussic acid was as usual procured, by distilling it with muriatic or hydro chloric acid.

The dose directed is, at first,  $\frac{1}{4}$  to  $\frac{1}{2}$  of a drop, increased very gradually, and suspended if found to produce vertigo. It may be administered in emulsion with gum arabic or loaf sugar and water.

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*Family Papaveraceæ—Sanguinaria Canadensis—Bloodroot—Puccoon.*—This plant grows very commonly in the United States. Its leaves are roundish and deeply indented, and it appears among the very earliest visitors in spring. It grows in rich woodlands, and flowers in March.

Leaves reniform, or kidney shaped when spread out, with large lobes, separated by sinuses. Under side reticulated with veins, paler than the upper.

Scape round, rises in front of the petiole.

After the flower has fallen, the leaves continue to grow.

The root, which is the part used, is externally of a brownish red color; internally it is pale, and when divided, a bright orange colored juice comes out from numerous points of its surface. The coloring matter seems to reside in the resinous part of the root, since an alcoholic solution contains twice as much as the aqueous. Papers dipt in these solutions receive a bright salmon tinge from the Tincture, but a very faint one from the Infusion.

*Of the Medicinal properties of the Sanguinaria.*—These are extensive, and it is capable of producing such different positive effects, that the exact class under which it ought to be considered, has been differently arranged by different writers. By some, it was valued for its emetic and expectorant properties—by others, for its tonic, and by others placed under the head of Narcotics, as it exhibits all these effects according to the dose in which it is given.

It is under this head I prefer to consider it.

Taken internally, in small doses, it increases the excitement of the sanguiferous system, augments the action of the lymphatics of the viscera—excites appetite, and promotes digestion—and has been thought to lessen the pulse analogous to Digitalis. This, however, is its secondary operation, since in its primary, it seems to accelerate the circulation.

In a large dose, it nauseates, diminishes sanguiferous action, produces faintness, and often vertigo and finally emesis. In improper quantities, it vomits with much violence.

It is, therefore, Tonic, Deobstruent—Narcotic, and Emetic. With powers so diversified as this article possesses, it has been applied to a variety of cases, and very good authority supports its reputation, in several obstinate and protracted diseases.

The most important are—1. Rheumatism.

Much has been said of its utility in this distressing affection—and the reports of its success are very satisfactory. It has been employed during the acute stages of this disease, and it is directed to be given in such doses as will produce a sense of sickness at the stomach, which is to be continued for several hours, when relief will have been afforded—repeated in the same manner the next day, and its use continued, a cure will very commonly be effected. Given to the extent of producing nausea, its Narcotic effect seems exerted, with it the pain subsides, and the action of the sanguiferous system is also reduced. Previous to a recourse to this medicine, V. S. if necessary, and some depleting remedies, should be employed. The preparation to be used, is the following.

Root of Sanguinaria C., ꝑii.

Spts. of Wine, ꝑvjii—m.

Dose gtt. xxx. every 3 hours, until nausea is produced. Employed in this manner, I have used it very advantageously, and have heard it spoken of very favorably by a medical friend.

2. In derangements of the Hepatic system, occurring as an idiopathic affection, but more particularly as a consequence of bilious remittent, or other Fevers, it may be very advantageously employed. Accompanying these derangements of the secretory functions of this organ, there is also enlargement and tumefaction of the gland, feeble digestion, feverishness, the skin sallow or bombeycinous. This condition of the system frequently continues a considerable time, and under these circumstances the mercurial remedies are much, but unavailingly employed.

The Sanguinaria, I am satisfied, is far better adapted. To a decidedly alterative operation upon the secretions, by which deficient secretions are renewed, or a torpid state of the organ overcome, other impressions are established of great and essential utility. By its Narcotic impression, pain and irritation are lessened, and febrile excitement moderated. Following in the train of these effects, a better appetite is established—the secretions generally are improved—a better condition of the skin succeeds—the system recovers its wonted strength and activity.

In Jaundice it is much employed, though not trusted to exclusively. In these cases, it is given in powder, or in a pill in the dose

of from 2 to 6 grs., and its utility was sanctioned by the late Dr. McBride.

In Bilious Colics and Bilious Diarrhœas, I could relate several instances of its successful administration, after a variety of other means had been unavailingly employed.

It has been recommended in Diseases of the Thorax, but with what effect, I have not been able to determine from experience. It has been employed in the acute as well as chronic affections; but it is only in the latter that I should judge it advisable.

In these cases, where the respiration is difficult, with cough and occasional hæmorrhage from the lungs, it has been found useful. In Hydrothorax it is given in doses of 60 drops, 3 times a day, and increased until nausea has been produced. In a week or two its good effects have been experienced—the pulse being rendered more slow and regular, and the respiration much improved. In Pertussis and in Asthma, it has also been spoken of favorably.

As an external remedy, the powdered root has been found beneficial in ill conditioned ulcers, with callous edges, and an ichorous discharge; it has also been employed in Polypi of a soft consistence and as stirnutatory. I have employed it in several cases of this nature with great advantage, the polypus being removed; and it is especially useful, after an operation, for the purpose of checking the growth of a new tumor, when symptoms of it appear, equal parts of the finely levigated powder and calomel, being employed for this purpose.

The forms in which this medicine is used, are Powder, Tincture and Infusion.

The simple Tincture is prepared, in the proportion of  $\text{z}\text{ii}$ . of the root to one pound of spirit of wine, and the dose is 30 drops every 2 or 3 hours, increasing to 80 or 90 or more.

The Powder is given in doses of from 5 to 8 grains as a deobstruent, and Narcotic; and in still smaller doses as a Tonic—as an Emetic, in doses of from 10 grs. to  $\text{z}\text{i}$ . The infusion is made with a drachm of the powder to a gill of water, of which a table-spoonful may be repeated, till the effect of the medicine is obtained. It is a circumstance which greatly lessens the value of this medicine, that its powers are much impaired by age, and by drying, it loses 70 per cent. of its weight. The recently dried root possesses the greatest activity, but in the course of a few months, its virtues are diminished as much as one half, and perhaps more. The same is true of the tincture, and the wine, but the latter retains its efficacy the longest. From this root a peculiar *alkaline* principle has been obtained, to which the term Sanguinarine has been applied. It has been employed in very minute doses in the same diseases in which the root has been recommended.

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*Family Apocynæa*—*Strychnos Nux Vomica*.—The tree from which this article is procured, grows in the East-Indies. It produces a fruit of the size of a small orange, in the pulp of which is contained seeds, which furnish the officinal *Nux Vomica*. The seeds are flattish, depressed in the centre, concave on one side, and convex on the other, and covered on both sides with a velvety down, and containing a horny, semi-transparent perisperm, which encloses an embryo with two cotyledons.

All parts of the plant are extremely bitter, and contain more or less *Strychnia*—but it is from the seeds, that the active principle has been extracted.

*Chemical Analysis*.—1. *Strychnia* combined with *Strychnic* or *Igasuric* acid, forming a *Strychnate*.

2. A yellow coloring matter.

3. A concrete oil.

4. Gum.

5. Starch.

6. A small proportion of Wax.

7. *Bassorine*.

8. *Lignine*.

Besides *Strychnia*, *Nux Vomica* contains also another active principle—*Brucia*, in combination with *Strychnic* acid.

Like other vegetable alkaloids, *Strychnine* combines with acids so as to form soluble salts.

Besides uniting with acids, *Strychnia* unites with Iodine, so as to form very important compounds in a medicinal point of view.

*Medicinal Properties*.—The *Nux Vomica* has no odor, but a very bitter taste, and when given in large doses, is possessed of very destructive properties, producing great disturbance in the functions of the animal economy, as anxious breathing, retching and nausea, tremors, violent convulsions, tetanic spasms of extraordinary force, asphyxia and death.

It exerts an action, in a high degree, upon the brain and spinal marrow, giving excitement to these parts, and through them to the whole muscular system of the body.

It is possessed of *Narcotic* properties, but in many respects differs from most articles of this class, and may be considered as peculiar in its operation upon the system. A circumstance that may be considered a peculiarity, is, that examinations of bodies destroyed by this substance, discover no alteration in the tissue, by which we are led to a knowledge of the immediate cause of death.

The whole of this class of plants are remarkable for their highly poisonous properties—under it being comprehended the *Strychnos Upas Teute*, the famous tree of Java—the *Strychnos Amara Ignatia*. The *Strychnos Nux Vomica* has been

long employed in medicine, and had acquired some reputation in Germany, and Italy, combined with Gentian in the treatment of intermittent Fevers—as a Narcotic in mania, and was employed in epilepsy, hydrophobia, and other diseases. But as its exhibition was often attended with spasms and vomiting, it had been laid aside, and was employed for few other purposes than as a poison against rats and other vermin. Thus it remained, until the experiments of Raffineau, Delisle and Magendie, upon the effects of the upas teute upon animals. From these, they were convinced that this article, in common with others, had the effect of creating in man and brutes, an artificial tetanus. It was with a knowledge of this fact, thus acquired, that it was afterwards conceived by Dr. Fouquier, that the Strychnos Nux Vomica might be useful in paralytic affections, by exciting a tetanic action, and thus creating a new action in the muscles of the palsied limbs. He experimented, therefore, not only to define the singular agency of the Nux Vo., but also to estimate correctly its safety and importance as a remedy. In these experiments, he was assisted by other physicians, and the result was highly favorable to its use in this disease. The effects of the Nux Vomica are felt in a very short time after it is taken, and according to the dose, the voluntary muscles experience strong and permanent contractions, and these contractions more readily take place in the parts or limbs affected with palsy, and this in proportion as they are deprived of motion or feeling. It is remarkable, however, that the diaphragm is not affected by the spasms. The cases to which this medicine was applied, sufficiently test its utility, and there can be no doubt that it has proved more decidedly beneficial, than any other remedy heretofore employed in paralysis. The symptoms which are considered as favorable in its use, are, a sense of thrilling, or throbbing, or starting in the affected part or limb, an internal sense of unpleasant heat, or an increased sensibility all over the parts deprived of motion. It may be useful to give an abstract of one of the cases in which this article was employed advantageously, and the effects which follow its use. A soldier was first attacked with uncasiness and numbness of his lower limbs, and successively of his arms; lost at last the power of motion in the first, and partially, but considerably, of the latter. He remained confined in his bed, where no more remarkable alteration succeeded, but emaciation of the palsied limbs. On the beginning of August, he was put on the use of eight grains a day, of Nux Vomica, when he soon felt thrilling, and prickling in the toes, which he could move, and also give some extension to his legs. In eight days, he was able to transport them from side to side; the hands equally progressed, and acquired more feeling. Six weeks after commencing the article, he could stand on his legs, and walk around his bed; and the

next month, he walked freely, supported by crutches. The dose now taken was 24 grains a day. It happened that the supply of the Nux Vomica became exhausted, and could not be procured during a month. The mending of this patient was therefore suspended, and much retarded, until the beginning of the ensuing year, when a fresh supply being obtained, its use was continued, and he was discharged perfectly cured. Other cases may be stated, but the effects of the medicine, and the progress towards improvement, bear a striking connection in them all. In the application of this article to paralytic affections, it would appear to be less useful in that species of the disease arising from apoplexy, but to be principally advantageous in palsy arising out of an impaired state of the nervous energy, or those cases brought on by excess in venery, in liquor, in narcotics, by metallic influence, by rheumatism, and by acute diseases—all cases arising in any of these causes, are proper objects for the use of this article. I have known it employed in several instances, in this city, with great advantage, and, without hesitation, would recommend it to your notice. Dr. Thompson is of opinion, that this article does not influence the circulation of the blood in the brain, even when it is given in sufficient quantities to produce death. He, therefore, recommends it in cases, in which although the paralysis may have arisen from pressure on the brain, yet there is reason for thinking, that benefit may be derived from so direct and powerful a stimulant of the nervous energy.

Of the manner of administering the medicine.—It may be given in substance, in doses of 4 grs., 4, 5 and 6 times a day, which is the most appropriate quantity for an adult, and thus remove, by the gradual operation, any apprehensions of danger, as it may be discontinued, or not, according to the symptoms produced. As the quantity is to be increased, its use becomes inconvenient from its bulk, and this added to the very great reluctance which patients commonly express to the taking of the medicine, renders it necessary to prescribe a more agreeable form for its administration. For this purpose, an alcoholic extract is prepared. A certain quantity of Nux Vomica, after having been rasped, is submitted to the action of alcohol of 40°, and renewed until the raspings no longer yield anything to the solvent. This solution is evaporated slowly to the consistence of an extract. If alcohol, of less strength, be employed, the extract will possess less active qualities.

The dose of the extract, is from one to two grs., exhibited as the substance, in the form of pills, augmenting the dose gradually, until the expected effect, a thrilling, throbbing, tetanic shocks, and prickling, are experienced in the affected parts. When these are felt, the augmentation of the dose is to be discontinued. If continued after these symptoms are produced, violent tetanic



shocks are excited throughout the system, so as to throw the patient from his bed. Besides the diseases which have been mentioned, to which this article is best adapted, it has also been employed in some others connected with muscular relaxation, as in incontinence of urine, impotence, and in paralysis of the upper palpebra.

It has been recommended in diseases of the eyes, particularly amaurosis, and, from cases cited in the periodicals, it would appear, with much benefit. It is applied to the temples, the cuticle being previously separated by a blister.

In incontinence of urine in children—in weakness of the Genital organs, it has also been recommended, and in that debilitated state of the nervous system, which is more particularly indicated by an irresistable desire to fall asleep.

It has been given with advantage in Chorea Sancti Viti, and likewise for the destruction of Intestinal worms, which, it is supposed, to effect, by its extreme bitterness.

From the *Nux Vomica*, Drs. Pelletier and Caventou have obtained an alkaline matter, which has been called Strychnine.

The substance is obtained in the form of chrystals, and is insupportably bitter, leaving at the back of the fauces the sensation experienced from certain metallic salts; it has no odor—exposure to the air does not affect it. It is given in the same diseases as the substance, in doses of an eighth or twelfth of a grain, made into pills—*R.* Acetate of Strychnine, grs. ii.—Cons. Roses,  $\text{ʒss.}$ —divided in pill xxiv.; also given in draught, with as much distilled vinegar as is sufficient to make a transparent solution. Without this precaution, Strychnine is, from its insolubility, apt to vary much in its effects, according to the state of the stomach, being most active when this is ascescent.

It may be administered in the following manner:

- Strychnia, gii.
- Distilled Vinegar,  $\text{ʒss.}$

Dose—xx. drops, 2 or 3 times a day, in an infusion of orange peel.

Great discrepancy in opinion exists as to the effects of different doses of the Strychnia. It is to the badness of the article that we are to ascribe its inefficacy in small doses. Much that we meet with in the shops, contains a large proportion of *Brucia*, and the activity of the medicine is in the inverse ratio of the quantity of the *Brucia*—1 gr. of Strychnia being equal to 6 of *Brucia*.

The mode of ascertaining that Strychnia is pure, is to add to a mixture containing Strychnia, a small quantity of Nitric acid. The deeper the red which is produced, the larger must be the quantity of the *Brucia* present—and no Strychnia should be employed that

is tinged more than a pale reddish yellow hue by the Nitric acid.—*Sigmond.*

Of the poisonous operation of the *Nux Vomica*.—Poisoning with this article is not unfrequent. It is not easy to conceive why this substance should be selected, since it is exceedingly bitter, and death produced by it is described as accompanied with a great deal of torture. I knew of a case, in a negro girl, who, under the influence of anger, took a large quantity of rasped *Nux Vomica*, with a view to self destruction. Requiring much of the powder to produce its effects, and being extremely unpleasant, from its bulk to swallow, she did not take a sufficient quantity, and her life was thus preserved.

When taken in doses of a drachm or more, the following symptoms are experienced. A pain and heat in the stomach, burning in the gullet, a sense of rending and uneasiness in the limbs, succeeded by stiffness in the joints, convulsive tremors, stiffness of the muscles of the neck—severe pain under the ensiform cartilage, and at length violent and frequent convulsive contractions of the muscles, ending in complete Tetanus.

The smallest fatal dose of the Alcoholic Extract, yet recorded, is three grains, which was the quantity taken in the case of the Parisian bulletins. Hoffman mentions a fatal case, caused by two 15 grs. powders,—and in Hufeland's Journal, there is another, caused by  $\text{ʒii}$ . which was fatal in 2 hours.

The first object is to get rid of the offending cause—the use of emetics or the stomach pump must be resorted to as quickly as possible.

The second is to destroy the virulence of the poison—and for this purpose a tincture of Iodine should be administered. This antidote was discovered by M. Donné, who found that the Ioduret of Strychnia could be given in doses of  $\text{iiss. grs.}$  to a dog with impunity, whereas  $\text{ss. gr.}$  was sufficient to kill the animal. He, therefore, tried Iodine as a counter-poison, and gave a tincture of Iodine to dogs to which a gr. of Strychnia had been given. In seven cases, only one resisted the antidote, and in this, it was not administered until ten minutes after the poison had been swallowed.

When death has been the consequence of an over dose, the post mortem examinations have displayed scarcely any traces of inflammation even in the stomach; but the venous system is engorged with blood.

*Brucine*.—Instead of Strychnine, some of the continental practitioners are in the habit of prescribing Brucine, and it is stated, with considerable advantage. I have tried it, says Stokes, in 2 or 3 cases without much apparent benefit, and I am inclined to think, that it is decidedly inferior to Strychnine. In France, however, it is

largely employed, and has the reputation of being a remedy of considerable value in the treatment of paralysis. It has one advantage over Strychnine—it can be more easily divided and regulated, as far as respects the quantity given, as it is a much weaker preparation than Strychnine, one grain of which is equivalent to 6 grs. of Brucine.

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*Family Ranunculaceæ—Aconitum Napellus—Monk's-hood—Wolf's-bane.*—The species belonging to this genus, have been long celebrated for their deleterious action upon the human system. From the beauty of the flowers, some of them have been cultivated in our gardens, from which circumstance very dangerous accidents have occurred. The term Aconite is derived from *akoné*, a rock, because many of the plants are found growing in rocky situations in the forests of Sweden, France, Switzerland, and other places.

Napellus is derived from *Napus*, a turnip, from the resemblance of the root to a small turnip.

*Natural History.*—The root of the plant is an annual.

*Stem* erect, simple, clothed with leaves—rises to the height of two or three feet, and is terminated by a spike of flowers of a violet, or blue color.

*Leaves* palmated, divided into segments---deeply cut and toothed.

*Flowers* of a deep violet color, proceeding from the axis of the spike, supported upon short footstalks.

The deleterious qualities of this plant were known to the ancients, who regarded it as the most violent of all poisons.

The root is the most active part of the plant, though the leaves are also possessed of poisonous properties. Its sensible qualities are moderate bitterness, and on chewing the plant, a sensation of numbness will be felt on the lips and tongue, which continues for some hours. Its odor is faint and narcotic.

Its active principle is supposed to be an alkaloid, to which the term *Aconitia* has been given.

*Medical Uses.*—Notwithstanding the deleterious properties of this article, yet in the hands of the bold and indefatigable experimenter, Baron Storck, it has, in well regulated doses, been found useful in the treatment of some very obstinate and painful diseases. He experimented upon himself, in order to test its effects. In 1762, he published a treatise recommending the use of this article, and relates cases in which he had employed it. He commenced with the use of the Extract of Aconite—the quantity of 2 grs. mixed with two of sugar, and took successively small doses of this mixture without any particular effects. At length, upon increasing the dose, its power to excite diaphoresis was manifested, and was noticed not only as a casual occurrence, but whenever the medicine was employed in proper quantities. This occurrence induced him



to employ it in diseases accompanied with a diminished cutaneous secretion, as rheumatism, gout, cutaneous affections, &c., and he relates several cases cured by its use.

It was employed in scrofula, and scirrhus. The alarming consequences which have occurred from its improper use, caused it to fall into very general neglect.

The use of this article has been revived by Dr. Lombard, of Geneva, and more recently, by Dr. Sigmond. In rheumatism, he observes, that when the joint is tumefied and painful, the sufferings aggravated by the slightest touch, the skin hot, Aconite is the most serviceable remedy with which we are acquainted. It is surprising, he adds, how speedily pain is relieved, and health restored, by the administration of this agent. In Gout, he observes, that its efficacy does not seem less decided.

In Neuralgic pains, it has also been spoken of very highly. But as the pathology of such cases is often obscure, the remedy cannot be applied with certainty. The practice must often be experimental, and from the known operation of this article, it may be useful. It is employed as an external application, and given internally. When relief follows, it is often very soon after it is applied.

The preparations of this article are, the Extract and Powder. The Extract is prepared by subjecting the expressed juice to a slight boiling, and afterwards evaporating to a proper consistence on a sand bath. Its action is speedily evinced, and relief obtained in a few hours. The dose of the extract is from  $\frac{1}{2}$  to 2 grs., 3 times a day.

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*Family Urticææ—Humulus Lupulus—Hop.*—This plant is extensively cultivated in England and the countries of Europe, and is said to be indigenous to America. It often grows wild in the Atlantic States, and was found by Mr. Nuttall, growing spontaneously on the banks of the Missouri. The part used is the flower, which is a kind of cone or strobile. It has an odor somewhat fragrant and aromatic, and a taste very bitter, with some astringency. These are extracted by water. The Hop has a considerable degree of bitterness, which renders it a useful tonic, and in this respect will be noticed hereafter. It is also decidedly Narcotic. This property is but slight, when compared with opium, but it exists so modified, as to be rendered very useful, and is employed in constitutions and diseases where opium would either disagree or be inadmissible.

The Narcotic operation of the Hop is exhibited in the known effect of porter and other malt liquors, into which it enters as an ingredient, producing a disposition to sleep, in such a degree, as to be called "heavy drinks." That the anodyne effects of these liquors are derived from the Hop, is proved by their being propor-

tionate to the quantity of the Hop which enters into the composition. For instance, beer exerts its anodyne effects more decidedly in the summer than in the winter, because the brewers find it necessary to use more of the Hops for its preservation in the former season than the latter.

From the anodyne property which it possesses in conjunction with an agreeable bitterness, it has been employed as a stomachic in various cases of dyspepsia, in which it operates favorably in giving tone to the stomach, and allaying irritation. In other diseases depending upon irritability of the nervous system, where opium was greatly wanted, but could not be exhibited in any of the usual forms, without producing violent retching, severe head ache, and other unpleasant symptoms, a strong tincture of this article, given in proper doses, has seldom failed to soothe the pains, and, finally, to procure calm and tranquil sleep. Besides this mode of exhibition, it is employed in the form of a Hop pillow, and is very useful as a soporific in tooth ache, ear ache, and some nervous head aches. The Tincture is prepared in the following manner:

Take of Hops,  $\text{ʒiv}$ .

Proof Spirit, 2 pints—macerate for 14 days and then filter—the dose is  $\text{ʒss}$ . to  $\text{ʒss}$ .

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*Family Convolvulaceæ---Gelsemium Sempervirens---Yellow Jasmine.*—The characters of this plant are the following. Stem twining, smooth, glabrous. Leaves opposite, perennial, lanceolate, of a dark, shining green color on the upper surface, paler on the under. Flowers in clusters. Corolla yellow—border obscurely 5 lobed—lobes round and equal.

This beautiful plant flourishes in almost every soil in the maritime districts of Carolina and Georgia, though it prefers moist and rich lands. It abounds along the roads, covering the shrubbery with its rich foliage, and flowers, perfuming the air with its delightful fragrance.

This article is possessed of Narcotic properties in a very considerable degree, and by virtue of this property has been applied to several diseases.

It has been employed in Rheumatism with some success, and in 2 or 3 cases, related by a graduate of our school, after the disease had existed for some time, and resisted a variety of remedies. It is also employed in Gonorrhœa. The part used is the bark of the root, and it is best given in the form of a Tincture, in the proportion of  $\text{ʒi}$ . of the bark to a  $\text{lb}$  of spirits. Thus prepared, it is extremely active, and its effects upon the system are the same as those which characterize the Narcotics. It exerts a strong influence upon the brain, and nervous system, to such a degree,

that I have known 90 drops, taken in 3 doses, produce vertigo, tremors, perverted vision, the objects seen appearing double, and all idea of distance entirely suspended. The case in which the article was given, was a gentleman laboring under Gonorrhœa. He was directed to take 30 drops, 3 times a day. He had taken two doses, and a third before breakfast, and was surprised in finding that upon extending his hand to reach the butter, there appeared to be two plates of butter, and he could not distinguish the real from the imagined object, so that for a time, he was really cutting at a shadow. The medicine was discontinued upon these feelings being experienced, and he could not be induced to continue its use. From this statement, you will be convinced of its great activity, and if I could compare it to any known article, it would be the Prussic acid.

From its decided influence upon the nervous system, it might be extended to the treatment of the diseases so much connected with irritation, in which that article has been recommended. At all events, its effects might be borne in recollection, and its operation tested in some of the forms of chronic and irritative disease.

Many other articles enumerated under the Narcotics, might be mentioned, but having brought to your view the most useful and important, with their applications, I shall refer you, for a knowledge of those that remain, to the systems of M. M.

#### ANTI-SPASMODICS.

The operation of this class of medicines is involved in so much obscurity, and presents such difficulties, that few writers have attempted an explanation. The production of spasmodic diseases is so closely connected with the deranged states of the nervous and sensorial systems, with the operations of which we are wholly ignorant, that a like ignorance must attend our explanations of the actions of medicines supposed to be exerted upon them.

In their operation, the medicines of this class, are capable of exciting the actions of the system, and they are equally effectual in allaying pain and inordinate muscular action.

They differ from the narcotics, in not producing that state of stupor and insensibility which follows their application—at the same time, they are useful in diminishing muscular contraction. This difference has been explained upon the supposition, that as stimulants, they have greater durability of action than the preceding class, while their anodyne power is inferior. They, therefore, hold an intermediate station between narcotics and tonics, and experience shows, that they partake of the properties of both.

As all attempts to explain the operation of this class, will be entirely speculative, I shall pass over this part of the subject.



In proceeding to speak of the articles of this class of medicines, I ought not to disguise that they are very rarely employed, at least by myself. So great a revolution has of late taken place in the pathology and treatment of nervous and convulsive diseases, that the remedies which were once in vogue, are now rarely administered. These diseases have, for a long time, been considered as originating in great mobility of the system.

By this term was meant, much excitability, connected with a debilitated, or more properly, a delicate habit of body.

Such, doubtless, is the state of constitution giving rise to these diseases—but it should also be observed, that the phenomena of nervous excitement, or the symptoms these diseases present, originate often in excited states of the cerebral and spinal systems, and in many instances stimulants, particularly of the diffusible kind, comprised under this class, are often injudicious and improper. Such at least has been my views, in the management of these cases, particularly during the states of excitement, or while the paroxysm is on.

In many instances, particularly in Hysteria occurring with delicate females, I have afforded almost instantaneous relief by depletion, by drawing a few ounces of blood, by keeping the apartment cool, by cold applications to the head, cold drinks—and by these means, more prompt and effectual relief has been afforded, than by the whole catalogue of Anti-spasmodics successively employed.

There are periods, however, when these medicines can be resorted to. In the intervals of the paroxysms, they are of use to fortify the nervous system, and to calm the irregular and disorderly movements. They seem adapted to lessen that excitability which is too readily excited into action, upon any, even the most trifling occurrences, which have reference to the feelings and sensibilities. Anti-spasmodics, though useful, are not even here the most approved means. This very excitable state, or unequally balanced condition of the system, is often effectually, and, I believe, most effectually removed, by bringing into action the corporeal energies—by giving vigor to the muscular system—by exercise—by tonics—by change of air—of climate—by soothing mental anxieties, or removing them, if practicable—and very often, by renewing secretions, or discharges, which have been interrupted—of these secretions the most important is the catamenial.

Sub-acute forms of these diseases will occur, in which a depleting course cannot be pursued, and where the chronic remedies which are to be resorted to in the intermissions, cannot be practised. Under these circumstances, the Anti-spasmodics, strictly so called, must be resorted to.

It should be observed, that all the substances which we are to

consider under this class, are vegetable, gummy resinous, or aromatic substances, or animal substances of much odor, or chemical substances which are very diffusible. It is, nevertheless, in this vegetable or animal aroma, that the diffusible property, and the Anti-spasmodic effects, of these substances reside.

#### PARTICULAR ANTI-SPASMODICS.

*Family Umbelliferæ—Ferula Assafætida*—An umbelliferous plant, resembling our Fennel, and growing particularly in Persia.

The root is perennial and heavy, and increases to the size of a man's arm or leg, covered with a blackish colored bark, and beset near the top, with many rigid fibres. The internal surface is white, fleshy, and abounds with a thick, milky juice, yielding an excessively strong alliaceous smell.

Assafætida is the concrete juice of the root of this plant, which is procured by making a transverse incision at the top of the root, and allowing the juice to exude upon the surface of the wound. It is scraped off by a proper instrument, and exposed to the sun to harden. The same operation is repeated, until the root is exhausted of its juice, when it soon perishes.

It has an acrid, pungent taste, and is well known by its peculiar, nauseous, fetid smell, the strength of which, is the surest test of its goodness. This odor is extremely volatile, and of course the drug loses much of its efficacy by keeping. It is received in masses, composed of various shining little lumps or grains, which are partly whitish, partly of a brown or reddish, and partly of a violet hue. Those masses are the best, which are clear, of a pale reddish color, and variegated with a number of fine white tears.

The Analysis of Assafætida affords the following results. In 50 grs. of Assafætida, 32.50 are of a particular resin, which becomes of a red color upon exposure to the light. This resin has no odor unless it is impregnated with a portion of the essential oil.

1.80. of a volatile oil, to which its owing its odor and acrimony—9.72 of a gum, resembling gum arabic—5.83 of a matter analogous to the gum of Bassora,\* malate of lime.

The uses and virtues of Assafætida are very considerable. In many parts of Arabia and Persia, it forms an important article of the M. M., and is employed largely as a condiment for food.

The Banian Indians, who not using animal food, have always recourse to the strongest and most acrid condiments, employ Assafætida liberally in their cooking, and even rub their mouths with it before meals, to stimulate their appetites. The fetor which transpires from the bodies and evacuations of those who use it is so

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\* A gum analogous to Tragacanth.

excessive, as to be almost intolerable even to the organs of the natives. Medicinally, it has always been esteemed in all those diseases which have been considered spasmodic or nervous, and, as a popular remedy, there are few which we more frequently have recourse to in these cases.

The diseases of the class Neuroses, in which it is most commonly employed, are hysteria and hypochondriasis, and in some of these cases its administration will afford relief. It is given during the paroxysm of the disorder, and as its effect is not very permanent, the dose should be large and frequently repeated.

Where the presence of the hysteric paroxysm prevents medicine being taken by the mouth, it has been found useful to give it in the form of glyster. In this manner, Assafœtida is often very advantageously administered—and not only in this disease, but in flatulent colics, and convulsive affections generally, and in tympanites. It is prepared in the following manner.

Assafœtida,                    ʒii.

Decoction of Barley, ʒxx.—m. for an enema.

In other cases in which it is employed, as epilepsy and the convulsive affections, it is undoubtedly too feeble to contend with them—though it may be useful by allaying irritation, and moderating the violence of the spasms.

In many diseases of the Alimentary canal, it is highly serviceable, particularly when the powers of digestion are weakened by habits of intemperance.

It is also useful in relieving many of the unpleasant symptoms, which so frequently attend dyspepsia.

It is employed in the form of a pill, as a carminative, in these cases, and is effectual, not only in relieving the bowels of flatus, but has manifestly a laxative operation. Its good effects in these cases are dependent upon its stimulating operation—hence it is employed by the inhabitants of India to season their food, and they regard it as an excellent stomachic.

A preparation with the Assafœtida, called the Gum Pill, is a useful one in old people, as it strengthens the bowels, while it keeps them in a soluble state. It is made in the following manner.

R. Assafœtida—Galbanum, and Myrrh, à ʒi. Oil of Amber. ʒi.; Syr. q. s.—make into Pills of a convenient size.

ij. of these pills are generally a dose. If necessary, a little Aloes may be added.

In many diseases of the Thorax, it has also been highly recommended.

In Spasmodic Asthma.—In this disease, though it may afford temporary relief, yet the complaint is of too obstinate a nature to receive a material check by this article. Still, it may be useful by its expectorant properties, and its tendency to diminish spasm. It is, however, more particularly in Pertussis or Hooping-cough,



that it becomes indisputably useful. Given in the form of a watery solution, after the inflammatory action has been subdued by antiphlogistic measures, the happiest effects will often result. The only objection to it, is its unpleasant taste, and the difficulty of making children take it. Where this is obviated, and the solution is not resorted to too early in the complaint, it will be found very effectual in restraining the convulsive cough, and other distressing symptoms of this disease.

Besides this complaint, it is very useful in some other coughs, and particularly in the secondary stages of Catarrh, when a difficulty of expectoration and dyspnœa exist. Indeed, whenever a stimulating expectorant is required, the watery solution of Assa-fœtida will be found very useful, and nothing answers better in the cough following measles.

Such are the principal complaints in which this medicine exhibits its good effects. It has also been recommended in several others, as in amenorrhœa, and as an anthelmintic, but its utility is very doubtful in these cases.

Forms of Exhibition.—Consisting of a gum, and resin, it may be administered in the form of Tincture, Watery Solution, or Pill. The Watery Solution is more powerful and less heating—the dose is ʒss. The dose of the Tincture is gtts. xxx. to lxx. As an Enema, ʒii. to ʒiii. dissolved in ℥ss. or ℥i. of water.

*Family Valerianæ—Valeriana Officinalis.*—The roots of this plant are perennial, and indigenous to England and Germany. It grows in moist and dry situations, and its qualities are much influenced by the degree of exposure to heat and light, as well as the kind of soil in which they are cultivated. The roots, which are obtained in a soil dry and elevated, have much more odor, and contain more medicinal principles than those which are collected in a moist or shady situation.

Much care should also be observed in collecting the roots. They ought not to be taken up until they are two or three years old, and they should be gathered before the leaves shoot forth.

The roots, the only part used, are fibrous, and the fibres proceed from a central knob. They possess a strong, peculiar, and unpleasant taste. If a person remains in a room which contains a quantity of the root, the air becomes charged with the aroma of the plant—sneezing, and a slight disorder of the mental faculties, are produced. This aroma excites upon some animals, particularly the cat, peculiar effects. It is attracted by the smell of the roots, and as soon as it smells them, it rolls itself upon the ground, and is thrown into an extraordinary degree of agitation, feelings of a pleasurable nature being excited.

In this animal is exhibited, in a high degree, the effects of the

odor of the plant upon the nervous system—and it is from its operation upon this system, that it becomes useful in those diseases termed nervous.

Analysis.—M. Tormsdorff has found that a pound of this root is composed of,

Fecula,	ʒii.
Gum Extract,	ʒiss.
A Black Resin,	ʒi.
Volatile Oil,	ʒi.
Ligneous Matter,	ʒxi.

According to the same chemist, the camphorated odor and aromatic taste, depend upon the volatile oil—its fetid odor. and acrid, disagreeable taste, to the resin, and the sweetish taste to the gummy extract.

The effects of this article are stimulating in a considerable degree. It accelerates the circulation, increases the animal heat—increases some of the excretions, as perspiration, and sometimes the urinary. It exercises considerable influence upon the nervous system—which is of a calming or soothing nature, allaying the agitation, sleeplessness—the wandering pains, and oppression, which so frequently attend in these cases.

The Valerian has been long known as an article of the M. M., and is supposed to have been the plant described by Dioscorides and Galen, as an aromatic and diuretic. It was brought into estimation, in convulsive affections, by Fabius Columna, 1592, who relates, that he cured himself of an epilepsy, by the roots of this plant. But, Columna suffering a relapse of his disorder, no further accounts of its efficacy are mentioned, until some time afterwards, when three cases of its successful employment were related.

From its utility in these cases, its application to other complaints, called nervous, was inferred, or those diseases produced by increased mobility and irritability of the system generally. In the diseases of this system, its best effects are exhibited, and to which it is now most commonly applied. As a remedy, therefore, in hysteric, and other spasmodic affections, with an irritable state of constitution, which attends these cases, it may be relied upon, and many reports have been made favorable to it. That it does sometimes fail, there is no doubt; but this may be ascribed to the diversity of causes upon which the disease depends, or to the article being employed in an improper condition. In the state in which it is commonly found in the shops, its sensible qualities are often much impaired, and unless it is taken up at a proper season, and properly preserved, it is often a very inert substance. Its Anti-spasmodic virtues are well established, and provided it be employed in a proper state, it will be found beneficial—only it should be used in larger doses than is commonly prescribed.

In that violent affection of the head, called Hemisrania, which often assumes an intermittent form, it has been employed, and is found very useful, especially when combined with Peruvian bark.

The same combination is useful in Chronic Hysteria, in females of a cold, phlegmatic temperament. It was also recommended in Typhus or Nervous fever. Where the system was much prostrated, with a pulse small, quick and frequent, respiration short, and hurried, with great derangement of the sensorial functions, it is employed, combined with ammonia and with bark. It has, however, fallen into disuse in these cases, though I believe that it may, with much advantage, be administered.

The Valerian is given in Substance, Tincture and Infusion, also Essential Oil and Extract.

In Substance the dose is  $\mathfrak{z}\text{i}$ . to  $\mathfrak{z}\text{ss}$ . three times a day—though so considerable a proportion of Valerian root consists of mere inert woody fibre, that the powder cannot be considered a commendable form for its exhibition.

In Tincture the dose is from  $\mathfrak{z}\text{ii}$ . to  $\mathfrak{z}\text{ss}$ .<sup>\*</sup>—and of the Infusion,  $\mathfrak{z}\text{ii}$ . three or 4 times a day. The Infusion is prepared by simmering an ounce of the bruised roots with twelve ounces of water for 10 minutes—and of this  $\mathfrak{z}\text{ii}$ . may be taken twice or three times a day with the addition of a drachm of the Tincture. By boiling, its virtues are lost.

As an Anti-hysteria, it is usually conjoined with assafœtida, ammonia, and other nervous stimulants.

Essential Oil.—The pleasantest and most effectual mode is to dissolve the Essential Oil in Brandy, 20 or 30 drops to  $\mathfrak{z}\text{i}$ . or  $\mathfrak{z}\text{ii}$ .—and of this, 2 to 3 teaspoonsful may be taken in water.

The Extract is given in the quantity of 1, 2 or 3 drams daily.

*Family Liliacæ—Allium Sativum—Garlick.*—The root, which is the part employed, is perennial and composed of several bulbs enveloped in a common membrane. It grows spontaneously in Sicily, and is much used both for medicinal and culinary purposes. Every part of the plant, but more especially the root, has a pungent, acrimonious taste, and a peculiarly offensive, strong smell. This odor is extremely penetrating and diffusive, for, on the root being taken into the stomach, the alliaceous scent impregnates the whole system, and is discoverable in the various excretions. Garlic is nearly allied to the onion, from which it seems only to differ in being more powerful in its effects, and in its active matter being in a more fixed state. By stimulating the stomach, they both favor

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\* The London Pharmacopœia directs a Volatile Tincture, prepared by adding the Aqua Ammonia to the Simple Tincture, and this may often be prescribed, as it is a remedy which is speedy in its operation, and may be considered a good Anti-spasmodic formula.



digestion, and as the stimulus is readily diffused over the system, they may, therefore, be considered useful condiments with the food of phlegmatic people, or those whose circulation is languid, and whose secretions are interrupted.

The medicinal uses of Garlic are various. As an Anti-spasmodic, and Expectorant, it has long been held in repute in Spasmodic Asthma, and other complaints of the lungs, in Pertussis, certain cases of Dyspnœa, in Croup and in Tussis Senilis. In the last complaint it is particularly useful, where the lungs, from mere debility, are loaded with mucus, and is given combined with honey. As a stimulant, it has been used by Bergius in Intermittents, and he says, with success, which I do not doubt, for I have seen decided effects from it. It is a very common remedy among the vulgar, in this disease, taken in rum, and it not unfrequently effects a cure. In Dropsies, it was recommended by Sydenham. I have no experience with it, but I should suppose that it must be useful in Dropsies depending upon weak action, and torpor of the Urinary organs. It is also used in many complaints of the Alimentary canal, as in Dyspepsia attended with flatulency.

Garlic is used externally, in many disorders, as a Rubefacient, and is applied to the soles of the feet, to cause a revulsion from the head and breast—is applied to Tumors in the form of poultice, and to Whitlows and Setons. In certain cases of Deafness, a clove or small bulb of this root, wrapt in gauze or muslin, and introduced into the meatus auditorius, has been found an efficacious remedy—or a piece of cotton or wool may be soaked in the juice and applied in the same way. This last mode of using it, has been said to be useful in Ear-ache.

Garlick may be used in different forms. Swallowing the entire clove, after being dipped in oil, is recommended as the most effectual, or where this cannot be done, by cutting it into small pieces without bruising, it may be found to answer equally well—or it may be beaten up, and formed into pills—but in this way, much of the active matter evaporates.

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*Family Umbelliferæ—Galbanum Officinale—Galbanum*—A plant growing in Africa, about the Cape of Good Hope. The juice is obtained partly by its spontaneous exudation from the joints of the stem, but more generally, and in greater abundance, by making an incision in the stalk a few inches above the root, from which it immediately issues, and soon becomes sufficiently concrete to be gathered. Of this article, I may observe, that it scarcely has sufficient pretensions to retain its place in the *Materia Medica*. It forms an ingredient in the compound pills and compound plaster of Galbanum. As it has been my wish to treat only of those articles in general use, and which are possessed of acknowledged

properties, I shall pass it over, with several others, which are enumerated under this head.

To these articles might be added the Gum Ammoniac, and several of the Essential Oils, as the Cajeput Oil, which are usually placed under this head, but as they are possessed of Anti-spasmodic properties only in a slight degree, their consideration will be deferred until I come to treat of the class under which they may be most properly arranged.

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Of the Anti-spasmodics derived from the *Animal kingdom*, the most important is Musk. It is derived from the *Moschus Moschiferous*, an animal somewhat resembling the rein-deer, inhabiting Siberia, China, Thibet. The Musk appears to be a peculiar secretion, which is deposited in a small sac situated near the umbilicus of the male. This pouch or sac is an organ peculiar to the male, and is found under the skin of the belly, in front of the prepuce. The organ is of an oval shape, and the membrane which lines its internal surface, presents a number of irregular folds. It has a small orifice. It is in this cavity that the musk is accumulated. The secretion has the strongest odor in the animals which inhabit Thibet and China. In more Northern countries it loses a great deal of its aromatic qualities. In the rutting season it is formed in the greatest abundance, and its sensible qualities are more developed. The pouch in which it is formed, is only filled in the adult males: it is, however, always seen in the young males. It is usually imported in round, thin bladders, its natural receptacle, and covered externally with hair, in general containing not more than two drachms. When pure, it has a reddish brown color and uniform texture, with a very diffusive odor and bitter taste. In consequence of its high price, other substances are frequently mixed with it, or sometimes the place of the musk is entirely supplied by foreign matter, as blood, asphaltum, &c. Lead is sometimes introduced into the bag to increase its weight; to be genuine, the bags should have no appearance of having been opened.

**Medical Virtues.**—Musk has long been held in repute as an Anti-spasmodic, and was much esteemed in the treatment of those diseases to which this class of remedies is adapted. It possesses very considerable stimulating properties, and acts particularly on the nervous system, exciting it in a considerable degree, and giving activity both to the mental and corporeal energies. It has been thought to possess Anti-spasmodic powers to a greater extent than any of the other articles which have been mentioned, and has, therefore, been resorted to in the treatment of Tetanus. Various cases of the efficacy of this article in this disease are related. It was employed by Dr. Heberden, combined with opium, with no

small success, and the West-India writers also speak in its favor. To be effectual, however, it must be given in large doses, for it is only by the most powerful remedies promptly given, that we expect any beneficial results in this formidable disease.

Its reputation is also supported by the authorities of Drs. Hillary and Owen. The latter has related a very remarkable case of the efficacy of this medicine. It may be worthy of trial in a disease which has baffled the best concerted measures for a cure; but I confess I have not much confidence in it. In Hydrophobia it has also been employed, but with little advantage.

In Epilepsy, Dr. Thompson states, that he has derived more benefit from Musk, in combination with calomel, than from any other remedy, and is inclined to attribute much of the disappointment which others have experienced, either to the remedy not being genuine, or to the smallness of the dose.

To obtain the full benefit of Musk in this disease, the dose must be larger than that which is usually given; it should be repeated at shorter intervals, and its use longer continued. In an old, confirmed case, in which 3 or 4 fits were experienced daily, Musk given to the extent of ʒss. four times a day, reduced the number of fits to one in three months. It is used most advantageously in the advanced stages of Typhus Fever, when subsultus tendinum, singultus, and low delirium are present. In this condition of the system, this medicine has better maintained its reputation than in any other, and may be used with considerable prospects of success. It may be given alone, or combined with camphor in the following proportions.

R. Musk—grs. xv. Camphor, g. v. Confect. of Roses, q. s. ft. bolus.

When it can be given in the form of bolus, it is preferable, as in this way the perfume is not near so strong as in any other. Musk has also been much esteemed in the attacks of Retrocedent Gout, and several instances are related of Gout falling upon the stomach being relieved by this medicine. Dr. Cullen relates the case of a person affected with Gout, in whom it was very liable to be retrocedent, when it commonly attacked the stomach, the lungs, or head. When attacking any of these organs, it was relieved by large doses of Musk, repeated after short intervals. These cases are always sudden in their attacks, and extremely violent in their nature—very powerful medicines are therefore required, and from the highly stimulating and Anti-spasmodic properties of this article, it will be very advantageously employed either alone, or combined with opium. In Convulsive Hiccups it also has been employed. Besides these diseases, it has been used in Mania, Hysteria, Hooping-cough, Asthma, &c., but with effects not so decided as to entitle it to particular attention. The very high price of Musk will always prevent its general use, and from



this circumstance, it is very apt to be adulterated. From the frauds which are practised, the different reports of its efficacy has probably proceeded, since we are assured, upon the very best authority, that when genuine, it is a very powerful medicine.—*Cullen.*

It is given in doses at from 10 to 30 grains a day, either in the form of pills or mixture. The former is the best mode of administering it. The latter is prepared in the following manner. Take of Musk—Gum Arabic—powdered Sugar, of each one drachm—Rose Water  $\mathfrak{z}\mathfrak{v}$ j.—rub the Musk with the Sugar and then with the Gum, pouring in the Rose Water by degrees—dose  $\mathfrak{z}\mathfrak{ss}$ . to  $\mathfrak{z}\mathfrak{ii}$ . It may also be administered in the form of enema, particularly to children laboring under convulsions arising from the irritation of dentition. As a local remedy, it is useful in Atonic deafness, when inserted into the ear with cotton.

An Artificial Tincture of Musk is prepared by pouring Nitric Acid upon Oil of Amber—a resinous substance is formed, which is washed repeatedly in water, until the acid taste is removed, and it is then dissolved in Spirits of Wine. This Preparation has been said to be nearly equal in efficacy to the genuine Musk, but this I very much doubt—its sensible properties are certainly very inferior. It has been employed in many of the Spasmodic diseases, but not with decided effects in any but Pertussis, in which it often affords very great relief. The dose is xv. drops—repeated 3 or 4 times a day.

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The next article derived from the Animal kingdom is *Castor*. This substance is obtained from the Castor Fiber or Beaver, an amphibious animal, which inhabits the Northern parts of Europe, Asia and America. It is found near the rectum of both sexes, in two sacs or bags, containing a brownish, oily matter, a peculiar deposition of fat. It has a disagreeable narcotic smell and a nauseous taste. The best is brought from Russia; that which is commonly met with in the shops, is very inferior, and comes from Canada. It was formerly much used as an Anti-spasmodic in Hysteria, and some other Spasmodic diseases, but its very nauseous taste and unpleasant smell, together with the want of any very positive properties, have caused it to be rejected at present very generally. It is still retained in practice by a few, but they are principally of the old school. The dose is from grs. x. to  $\mathfrak{z}\mathfrak{i}$ . The usual form of exhibition is the Tincture, which is given in the quantity of  $\mathfrak{z}\mathfrak{ss}$ . to  $\mathfrak{z}\mathfrak{ii}$ .

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The next article is *Sulphuric Ether*. This is obtained by pouring sulphuric acid upon rectified spirit in a glass retort, and subjecting them to a gentle heat, so that the liquor may boil as

speedily as possible. The Ether passes over into a tubulated receiver—kept cold with either ice or water. The process is a complicated one, and the production of Ether is not fully understood. Its qualities are the following. It has a highly penetrating, diffusive odor, and a very pungent taste; it is colorless, transparent and of a specific gravity inferior even to alcohol. It is very volatile, and evaporates speedily at natural temperatures, and from the rapidity with which this goes on, a sensation of coldness is experienced. This article is deservedly held in estimation as a stimulant and Anti-spasmodic, both of which properties it possesses in a considerable degree. It is employed in Spasmodic Asthma, and in many of those diseases in which the organs of respiration are affected, where a state of congestion exists in the lungs, with an inability to expectorate, and a collection of tough phlegm in the trachea and bronchiæ. It is useful in this state, inasmuch as by its narcotic and Anti-spasmodic operation, it relieves the constriction which exists, excites the circulation, and by the stimulant impression which it communicates to the fauces, expectoration is promoted. It is equally useful in a paroxysm of Hysteria, and it is one of the most important remedies in Cramp of the Stomach occurring as a local disease, or from Gout being suddenly translated to that organ.

It is also used in Hiccups, and in Sea sickness. As a stimulant it is employed in the advanced stages of Typhus Fever, particularly where symptoms denoting Spasmodic action are present—as Subsultus tendinum—and a very useful formula is the following.

R. Infus. Green Mint, ꝥxvj.

Sulphuric Ether, ʒii.—Sugar, ʒii.—dose, ʒi. to ʒii. every 2 or 3 hours.

The proportion of Sulphuric Ether may be increased to three drachms. This mixture will be found of great service in contagious, petechial, and low nervous fevers. Its sensible and more immediate operation, is to relieve the lowness, anxiety, tremors, &c.—to lessen the irritability of the stomach, the irregularity and frequency of the pulse, and to cause a moisture and perspiration on the skin.

Externally it is applied to various purposes as a rubefacient. When this is intended, its evaporation is prevented by covering the part to which it is applied closely with the hand or anything else, when a sensation of burning is soon excited. It is also employed in relieving Muscular pains, and in Gout; and from the sudden coldness which follows its application, to inflammatory tumors—to head aches, often with great relief. The usual dose of Ether is from 20 to 30 gtt. and from its operation being so evanescent, the doses should be frequently repeated. It should

be administered speedily, before its strength evaporates, and in a vehicle not too warm.

Nearly allied to this, is Hoffman's Anodyne Liquor, the composition of which is not exactly known, but is supposed to be a mixture of Sulphuric Ether with a small portion of Alcohol and Oil of Wine. As it is weaker than the Ether the dose is larger. This Preparation is now dispensed with. The doses are the same as the preceding article, and the effect is the same—the Ætherial Oil only altering its flavor a little.

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The last of the Anti-spasmodics that I shall consider, is the Oleum Succini—or Oil of Amber. Amber is a bituminous substance, found on the sea coast in different situations. It is brittle, and when rubbed, emits a disagreeable odor and becomes electric. Mixed with fine sand, and subjected to distillation, an essential oil is procured, which is at first thick, and of a dark brown color, but by repeated distillations with water, it becomes limpid, still retaining, however, a very fetid odor. This article has been much employed in Hysteria and Convulsive affections, but is now seldom used in these cases, and appears to be principally resorted to in palpitations of the heart, and in Hiccups, in which diseases it is often productive of beneficial effects.

As an external application it is an ingredient in liniments for rheumatic pains, paralytic affections. The dose of the Oil is from 10 to 30 drops.

The medicines which have been mentioned are the most important of this class, and those which are strictly called Anti-spasmodics. But spasm often depends upon such different states of the system, and is excited by such a variety of causes, that the most opposite medicines are often found beneficial in its removal. Sometimes V. S. is the best Anti-spasmodic we can employ—or other depleting remedies—sometimes the narcotics, and at other times tonics. The judgment of the practitioner must be employed in making a selection, and he will act most for the interest of his patient who without attaching himself to terms or classes of medicines, is determined in his choice of remedies by the condition of the system, and those rules of thinking, and acting, which can only be acquired by steady and close attention to the morbid operations which are presented to him.

#### TONICS.

Under this class are included Stimulants with powers modified, and differing very essentially from any of the preceding. Their operation is to give Tone to the system. In doing this, they do not produce any sensible excitement, and by their gradual opera-



tion, they give vigor and activity to the vital powers without any depression following their use. In this respect, they differ very essentially from any Stimulants which have been mentioned. These, by raising the excitement to a considerable degree, are quickly followed by proportional languor and debility. But in Tonics, the Stimulant operation being more slowly exerted, any change is much less conspicuous, and the succeeding collapse takes place to no considerable extent. Their Stimulant effect is principally to be observed from their long continued use—when they increase the force of the circulation, strengthen the powers of digestion, excite the deficient secretions, and restrain them when too profuse—they also give strength to the muscular fibre and renovate the actions of the system.

Their action is not mechanical, as was once conceived, giving tension or tone (hence the term Tonics) to the muscular fibre, but it is exerted upon the whole system influenced by laws incident to vitality.

The action of Tonics will be most satisfactorily exhibited by considering their influence upon the different systems of the body.

1. The Digestive. The stomach is the organ primarily acted upon, and from it, by nervous communication, the whole system becomes invigorated. The stomach being improved, digestion is better performed, a more abundant and healthy chyle produced, and hence greater health and vigor is imparted to the body. The functions of the stomach being better performed, the fecal discharges exhibit a corresponding improvement in appearance. They are lessened in quantity, and are of a more firm consistence; they are retained longer in the Intestinal canal, and hence costiveness not unfrequently attends the employment of Tonics.

Tonics are improperly exhibited to persons in whom there is irritability of the stomach, and this connected with the presence of inflammation. Far from relieving this symptom, digestion will be found still further to languish, and there will be added anxiety, oppression, pains in the head, &c. They are improperly exhibited before the Intestinal secretions have been altered, and a healthy discharge procured.

2. Upon the Circulation. The contractions of the heart are increased in force and energy by the use of Tonics. The action of the Capillary system is strengthened in a considerable degree under their influence, and hence they are employed with much advantage in hæmorrhagies, connected with feeble action, in discharges from the skin—in increased secretions from the mucus follicles, &c.

3. Upon the Respiratory System. The action of Tonics in strengthening the powers by which respiration is performed, improves this function, without rendering it more frequent. The

blood experiences changes—it becomes of a more red or vermilion color, more consistent, and less serous.

4. Upon the Absorbent System. The action of these vessels is improved, by the rapidity with which Interstitial absorption is sometimes carried on—as evinced in the speedy removal of œdematous swellings.

5. Secretion and Exhalation. These functions are most commonly diminished under the action of Tonics. Connected, as they very often are, when in excess, with a debilitated condition of the system, they can only be advantageously resorted to under such circumstances.

6. Nutrition. In favoring digestion, Tonics improve much nutrition in general. Under these circumstances, the body returns to its natural fullness, the flesh to its firmness, the skin to its clearness, leaving little doubt of the advantageous impressions produced by a judicious use of this class.

7. The Cerebral System. The functions of the brain experience a like favorable influence.

The senses are more acute and more delicate—the understanding and memory are exercised with more readiness—the powers of locomotion are revived; a feeling of health, and of being well, animates the body; and the individual experiences that he is himself again.

It is in these several ways that Tonics exert an action friendly to life, and to the restoration of an enfeebled system.

Upon what principle they produce their beneficial effects, is not exactly known; but it seems to be connected with their Bitterness—as most of the Vegetable Tonics are possessed of this property. This, however, is not invariably the case, as many articles are bitter without being Tonic—as digitalis and opium—and some of the metallic preparations are Tonic, though void of bitterness.

Tonics are divided into *Vegetable* and *Mineral*, and in none of the classes are we supplied with so rich and abundant a collection. I shall treat of them as belonging to each of these kingdoms, and shall begin with the vegetable.

The Tonic power of Vegetables is intimately connected with certain sensible qualities—with their bitterness, astringency and aromatic flavor—all of them possess these qualities, though in different articles one may be more predominant than another. The purest bitters, astringents and aromatics possess more or less of a Tonic power, but as they each exercise a different mode of action, it is evident that a more powerful tonic will be obtained from the combination of these qualities, than where they exist separately. The most powerful Tonics are accordingly natural combinations of these principles, and of these the most important is the genus *Cinchona*.

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*Family Rubiaceæ—Genus Cinchona.*—The genus *Cinchona* comprehends a large and valuable number of plants—some of them grow to the size of a cherry tree. The leaves are oblong and lanceolate, the flowers are of a reddish color, from which is produced a pod in which is found a nut like an almond.

The soil in which these trees flourish, is generally red, clayey or rocky, and especially the banks of small rivers descending from the mountains.

The season for cutting the bark, is from September to November, and much care is taken that the bark is not cut wet, as it would soon loose its color, turn black and rot. On the trees being entirely stripped of their bark, they soon perish—and as the number of these trees to which access could be had, was not very considerable, it has been supposed that a sufficient quantity of the bark to supply the demand, could not long be procured. Condamine, however, asserts that the young trees do not die by losing their bark, and as those which are suffered to become old, have time to disseminate and propagate, the fear of exhausting this valuable medicine, is wholly groundless.

At what time the medicinal efficacy of the Peruvian Bark was first discovered, is not exactly known. By some, it was supposed to have been known to the Indians before the discovery of America; and by others, this is denied.

From tradition we learn the following history. That some *Cinchona* trees being thrown by the winds into a pool of water, lay there until the water became so bitter that every body refused to drink of it. That an Indian being seized with a paroxysm of fever, and finding no other water to quench his thirst, was forced to drink of this, by which he was perfectly cured. He afterwards related the circumstance to others, and prevailed upon some of his friends, who were ill of fevers, to make use of the same remedy, with whom it proved equally successful.

The most probable history of the discovery of the Febrifuge virtues of *Cinchona*, is the following, mentioned by Humboldt in his travels in South America. The Jesuits had noticed the considerable bitterness of the *Cinchona*—and there being always medical practitioners among the missionaries, it is said, they tried an infusion of the *Cinchona* in the Tertian agues, a complaint which is very common in some parts of S. America—and having found it succeed in curing the disease, began to employ it as a Febrifuge.

The use of this medicine was, however, very little known until the year 1639, when a signal cure having been performed by it on the Spanish Viceroy's lady, the Countess del Cinchon,\* at Lima,

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\* Hence the genus was called *Cinchona*.



it came into general use, and was distinguished by the name of the Pulvis Comitisse, or the Countess' Powder. On her recovery, she distributed a large quantity of the bark to the Jesuits, in whose hands it acquired still greater reputation, and by them it was first introduced into Europe, and thence called the Jesuit's Powder; and also Cardinal de Lugo's Powder, because that prelate bought a large quantity of it, at a great expense, for the use of the religious poor of Rome.

The varieties of Cinchona now in use, and to be met with in our shops, are the Pale, Yellow, and Red Barks, and of these, the two last, are of comparatively recent date.

The Pale Bark is considered as derived from the Cinchona officinalis of Linnæus, or the Cinchona Condaminea of Humboldt, and in common language, Grey, Loxa, or Crown Bark.

It is called Loxa, from the province and port where the Bark is obtained, and from whence it is exported—and it was in this province that the Cinchona was first discovered.

It is called Crown Bark, from the high estimation in which it was held by the Royal family of Spain.

It is found in the mountains of Quito and Santa Fee, and was regarded as of a superior quality, what was brought from Loxa, a province or jurisdiction in Quito, being preferred.

Description of the Plant. The tree rises to a considerable height, and is of the thickness of a man's thigh.

Branches are opposite, covered with a reddish brown bark.

Leaves from 2 to 3 inches long, and one broad, opposite, petiolated, acute, smooth on both sides, green above, paler underneath.

Flowers in a terminal panicle.

Capsules half an inch long, oblong, smooth, marked with obscure raised lines.

The best kind met with in the shops, is in thin pieces, singly convoluted, forming small, quilled twigs, internally of a cinnamon color, smooth but fibrous in the texture. Externally, it is covered with a thin epidermis, of a greyish brown color, to which a crust of Lichen some times adheres.

The taste of Pale Bark is bitter, and slightly astringent—its flavor is slightly aromatic, with a degree of mustiness. It was said to be by far the most valuable species of Bark, and from its acknowledged superiority, the Spaniards gave it the name of Cascarilla fina.

This opinion prevailed generally until the recent discoveries in Analytical Chemistry, and particularly in the analysis of vegetable substances. From analysis, it is proved to contain from 25 to 30 per cent. less Cinchonine and Quinine than the Calisaya (a species of Yellow Bark) does of Quinine, and the proportion of Cinchonine is much greater than the Quinine.

2. The Yellow Bark next to be described, is so named, not from its color being distinctly yellow, but because it approaches rather more to that color than the others.

Under this term, are comprehended two species.

1. *Calisaya Arrolenda*—Rolled *Calisaya*. This Bark is received from Peru, and is very common in the Province of *Calisaya*, from which circumstance it derives the name by which it is designated in commerce. It is derived from the *Cinchona Cordifolia* of Mutis.

It appears under two forms. In one, it is in rolled pieces, of the size of the thumb, having its epidermis of a greyish yellow, to which the Lichen is attached. Its internal surface is of a clear yellow, and of the thickness of one or two lines.

One of the striking characters of this species, is its extreme bitter taste, without any trace of astringency, and especially its fibrous structure. This is the best species of Bark, and it is that employed for the manufacture of Quinine, yielding a much larger proportion of this alkaloid than any other species.

The 2nd species, the Orange Yellow, is the Bark of the *Cinchona Lancifolia* of Mutis. It grows in Peru upon the steep tops of the mountains, also about the environs of Santa Fee de Bagota, where it was first observed by Mutis. The Bark of this species has a considerable resemblance to the *Calisaya*, but it is distinguishable. It is very rarely met with in commerce, and therefore it is unnecessary to enter into details of its description, or administration.

3. The Red Bark is derived from the *Cinchona Oblongifolia* of Mutis. It is a tree of considerable size, which grows not only in Peru, but is found in the kingdom of New Grenada. It is in larger and thicker pieces than the Pale, and more convoluted than the Yellow, though not actually forming quills or cylinders. It also breaks short—the inner part is very red, and it has an agreeable taste. It is more scarce in our market than either of the others, and when genuine commands a higher price. It has been thought to possess the virtues of *Cinchona* in a higher degree, and to have been the species used by Morton, Sydenham, and Lister, with such success in the treatment of Fevers. Recent experiments seemed to confirm these opinions, as it contains both Cinchonine and Quinine in a greater degree than are found in any other description of Bark. From some very late experiments of Mr. Carpenter of Philadelphia, these salts are less abundant in the Red than in the *Calisaya* by at least 20 per cent.

Such are the principal varieties in use furnished by the genus *Cinchona*. These varieties may easily be confounded with each other, because the distinguishing characters are not so fixed and decided as to remove all uncertainty upon this subject. If how-

ever, to the characters drawn from the colour, we add those furnished by the taste, much of the difficulty of discrimination will be removed. The Pale Bark has a taste bitter, and astringent—the Yellow a taste simply bitter, and in the Orange Yellow an aromatic principle is added. The Red is readily distinguished by the colour, but, in addition, has a taste extremely astringent, which nearly conceals the sense of bitterness.

The varieties enumerated do not comprehend all of this important genus. It is stated that there are many other species, no less than 20, the history of which is not known—and in consequence of the perplexity which arises from their number, and their being frequently mixed together, the knowledge of this important genus it still involved in obscurity.

The application of Bark to the cure of Diseases. This important medicine was originally introduced in the treatment of Intermittent Fevers, in which it is admitted to exhibit its best effects. Practitioners are united in opinion on this point, and the only difference which exists, depends upon the previous utility or inutility of evacuating medicines—the proper period of employing the Bark—the doses, and the manner of administering it.

1st. Upon the employment of evacuating medicines there can be little doubt, that when much Inflammatory action exists, particularly in what are called the vernal Intermittents, the antiphlogistic treatment should be employed previous to our having recourse to Bark, and there can be no doubt, that by this treatment alone they have been cured. When to this state of the system, there is joined bilious accumulations in the stomach, the use of evacuants is still more imperiously demanded. Of these, Emetics are commonly preferred, as they not only remove the bilious accumulations which occasion so much uneasiness and oppression about the precordia, but by being early employed, and by the shock they communicate to the system, they do much to break up the morbid actions which exist, and thereby favor the restoration of the healthy operations which the bark is calculated to complete. In support of this opinion are Van Swieten, Sir John Pringle, Sauvage, Senac, Baglivi, with many others, who all agree that evacuations should precede the use of Bark.

Cases undoubtedly will occur, when, from the violence of the paroxysms, as well as from the greater debility which accompanies them, a free and early use of Bark becomes necessary, and in which our evacuants should be more sparingly administered. This caution will be found more particularly necessary in what are called autumnal Intermittents and in relapses.

2nd. The proper period of employing the Bark. It was at one time a prevailing opinion, that the exhibition of Bark should be delayed until a few paroxysms had passed. This doctrine,



which was supported by the authority of Boerhaave, and others, is now found to be extremely false and erroneous, and it is commonly admitted that *the earlier we begin with the Bark*, the more speedy and certain will be the cure, provided the state of the arterial system, and the general habit of the patient, do not prohibit its use.

Intermittents are not unfrequently combined with visceral obstructions, in which cases there have been doubts as to the utility of Bark. But I would observe, that if we wait until such obstructions are removed, we may have seldom an opportunity of giving Bark, as they are chiefly owing to the Fever, and the sooner it is removed, the sooner the obstructions will be overcome.

It is impossible to deliver any precise rules on this subject, and much must be left to the discretion of the physician. Where there are symptoms denoting Inflammatory action, as pain, soreness upon pressure, excited pulse, it will be imprudent to have recourse to tonic remedies without previous evacuations, though Dr. Cleghorn declares that he has given the Bark with the best effects, with obstructed and inflamed viscera, without premising depletion. If the obstructions occur in weak and phlegmatic habits, there can be no hesitation about its propriety, and in such cases it will be prudent and necessary to combine it with small portions of Mercury, as by this combination we produce a deobstruent and tonic operation.

Of the period in the paroxysm when Bark should be employed.

The earliest practice in the use of this medicine, was, to give one or two large doses, either on the approach of the paroxysm, or in the cold stage—and it is stated, when given in this manner, it suspends the approach of the paroxysm.

From the authority of Dr. Sydenham, and most practical writers, the Bark is only given during the intermission, and the practice of employing it during the cold stage, or while there is any degree of febrile action existing, is now abandoned, as in the one case it would be rejected, and in the other would doubtless aggravate the symptoms of the Fever.

The quantity in which it ought to be employed, is in doses as large as the stomach will bear, and it may be carried to a considerable extent—in some cases, as far as an ounce of the powder, or 10 grs. of Quinine.

To this extent it is sometimes necessary to carry it, and I have known Intermittent fevers cured by a single dose, or a few such doses, which had resisted the medicine in smaller proportions, for a long time. The practice, however, cannot be generally adopted, as the stomach would not retain so much.

In some, so great is its irritability, that the smallest doses in powder cannot be retained, and we are, therefore, obliged to resort

to the Infusion or Decoction, to which are to be added aromatics. Thus combined, it will often succeed, when Bark alone has failed, and it is particularly adapted to children and delicate females. With the removal of a paroxysm, the medicine should not be discontinued, but its use is still necessary to prevent a relapse.

In considering the use of this article, we cannot but regard this property of preventing the periodical return of diseases, one of the most singular and remarkable. This property can no more be explained than the purgative or emetic property in other articles. It depends upon the modification or change which the principles of Bark impress on the general system, and which is only appreciable by its results.

Observation proves that this anti-periodical power does not depend upon its action on the Intestinal canal, for it acts as a febrifuge when introduced into the large intestines, when used in the form of a bath, or when the cuticle is removed by a blister, and the alkaline salt applied. Its good effects as a Febrifuge, would seem to depend upon its impression on the nervous and the circulating system, and according to the change thus produced, will be our success in its use.

In Remittent Fevers, the use of Bark is equally efficacious as in the preceding. This might indeed have been anticipated, as it appears to be the same disease with Intermittents, though under a different form, arising from the same causes, and often interchanging with them. In the Remitting Fever of warm climates, the oppressive load of bile on the *Primæ viæ*, as well as the imperfect state of remission, point out the propriety, and in some cases the necessity of evacuations prior to the use of Bark. In these cases there are evident appearances of a deranged state of the stomach and intestinal canal—the propriety, therefore, of evacuations, and particularly of emetics, is well established, and the remission is frequently rendered more complete by such practice. In short, these Fevers seldom have distinct remissions until they have been properly treated by evacuations, either by bleeding when the inflammatory symptoms run high, and at all events by emetics and purgatives.

When the Fever, by such remedies, is brought into a state of *obvious* remission—that is, when the pulse becomes from 10 to 20 pulsations slower at some particular time of the day—when the restlessness, anxiety, and tendency to delirium abate—when the mouth and fauces are moist—when the organs of secretion, and especially the skin, are more open and pervious—such symptoms of remission admit the use of Bark with the same freedom as in Intermittent Fevers, and it will be found to exhibit equally beneficial effects.

In the Remitting Fevers, however, of warm climates, the accession

of the paroxysm is so extremely violent, and the strength of the patient so quickly exhausted, that it becomes absolutely necessary to catch the first opportunity of the most trifling remission, and to give the Bark with freedom, even though all the symptoms of remission above mentioned do not exist.

Its administration is improper where there are symptoms of local or general excitement—when the tongue is red or dry—when there is thirst, or pain in the epigastrium—when there is tumefaction of the abdomen—when the stools are liquid, serous, or fœtid—when the pulse is strong or frequent, or the skin dry—when inflammation affects the serous membranes, or the parenchymatous substance—when there is hæmorrhage of an active character either internally or externally.

In the several forms of Continued fever, Bark is also very useful. Dr. Cullen says, that where they arise from the marsh effluvia, which produce Intermittents, they must be treated with Bark. But the advice applied to this country, would be extremely injurious, for this is exactly the case with our Continued bilious fevers, which are inflammatory, and will not admit of the use of Bark, except towards the decline.

Most Continued fevers commence with some degree of inflammatory action, and in this state, evacuations, such as the degree of excitement demands, are to be employed; but as every Fever of this type remits somewhat in its decline, Bark becomes essentially useful. At the close of such cases, when the pulse becomes feeble, with stupor, and great prostration of strength, the animal heat not much increased, with a disposition to form petechiæ, it acts very powerfully in supporting the vis vitæ, and will be found one of the most important auxiliaries which can be brought to our assistance.

When the prostration becomes still more considerable, more powerful stimulants must be resorted to, as the volatile alkali, wine, blisters, small doses of opium, &c.

Of the utility of Bark in these Fevers, as well as in the Typhous states of the system, I need not enlarge upon. In these cases, its efficacy must be obvious, and its administration has been fully pointed out by the professor of the practice.

From the observations I have been able to make, it appears to me, that Bark is much less depended upon in the treatment of the several forms of disease above mentioned, than formerly. Since the writings of Dr. Hamilton, and others, it has been found that free depletion from the bowels prevents those symptoms from being developed, which the Bark was supposed powerful enough to cure. Where the practice in Fevers was to prevent costiveness by almost daily glysters, if the patient had not regular stools, as were the directions of Sir J. Pringle, Dr. Cullen, Fordyce, and others, it is not surprising, that when to the irritation of increased



arterial action, was added that of the accumulated and morbid contents of the bowels, the symptoms of putrescency, as they were called, were frequently exhibited, and Bark was the chief remedy for their cure. From a more enlightened Pathology, we are convinced, that a contrary practice is best, and that by evacuating the bowels freely, these malignant symptoms are prevented.

For the truth of these remarks, I would appeal to the experience of physicians whose practice has kept pace with modern improvements, whether such is not the case—and certain am I, that I have seen all the approaching symptoms of Typhus prevented, the delirium removed, the head-ache diminished, and the state of the skin, tongue and circulation improved by evacuations from the bowels, and these evacuations continued from day to day, as long as they possessed an unhealthy smell, or a dark, unnatural colour. Formerly, when the symptoms were considered without reference to their causes, Bark, from its supposed antiseptic qualities, was chiefly relied upon—now, when their true source is better ascertained, it is only resorted to, to strengthen and support the system, after the more urgent symptoms have passed off.

In the above Fevers, the proper period for the exhibition of the Bark, is well established, practitioners being agreed, that when inflammatory action runs high, it is inadmissible. But a different opinion has been maintained in some of the Phlegmasiæ, and of these diseases particularly rheumatism. There are cases of this disease, in which the symptoms run so high as to require the active interposition of depleting remedies to moderate or subdue them—and under these circumstances, no one would think of employing the Bark or any tonic preparation.

But Rheumatism, notwithstanding the inflamed state of the joints, and the appearance of the blood, often assumes the form of a Remittent Fever, and under these circumstances, a perseverance in the antiphlogistic plan is generally found to be ineffectual. The type of the Remittent is usually that of a double tertian, and the patient is usually exhausted by the profuse sweatings which terminate the paroxysm. It is in such cases that the use of Bark is particularly recommended. In this, as well as in other forms of Fever, the inflammatory symptoms should be removed by moderate bleeding and purging, and the use of diaphoretics, before it can be treated advantageously as a Remittent. After this is fairly accomplished, the Bark may be employed, even though the state of the joints be such as to indicate a continuance of depleting remedies, which is often merely a local affection.

In the very troublesome affection of Hemisrania, or periodical head-ache, Bark may be used with the greatest success—preceding its use by an emetic. In this manner the disease has been cured,

when venæ sect., cupping, and blisters had been tried without effect.

In some of the Intestinal affections, particularly dysentery, Bark has been highly recommended. Its utility in this disease is predicated upon the frequent alternation of intermittent fever and dysentery, and whenever it assumes the intermittent form, Bark, combined with opium, exerts often a very salutary operation.

In the consideration of this article, it has been the custom to enter into the enumeration of a number of diseases for which it has been employed. This I conceive unnecessary, as in many, Bark exhibits no peculiar good effects, but shall confine myself to those disorders only, in which its powers are manifest and acknowledged.

I shall proceed to such of the Exanthemata as are benefitted by its use. In the early stages of Small Pox, the treatment is usually antiphlogistic, with a view not only of moderating the febrile paroxysm, but of diminishing the pustular eruption. In the advanced stages of the disease, when the pustules become flat, and contain only a watery, ichorous fluid, or are pale about the base, with petechial appearances either on their surfaces or interposed between them, such symptoms indicate a defective energy of the vital principle, and Bark becomes particularly useful. By its action upon the system, its powers are invigorated, a better suppuration established, and the symptoms of debility and malignancy removed. In support of the utility of Bark in these cases, the authority of several distinguished individuals may be adduced. Dr. Storck in particular, assures us, that in Petechiæ with extreme debility appearing on the seventh day, he has given the Bark with paregoric and cordial remedies, so as to have recovered his patients from the most desperate situations. In the secondary fever of Small Pox, it is equally applicable, and the beneficial effects are not less apparent—when it partakes of the putrid character.

Bark has also been recommended in some of the forms of Measles and in Scarlatina, but the cases requiring its use are very rare in this country, these diseases being most frequently of such an inflammatory nature as to require the use of depleting remedies. In Scarlatina, accompanied with what has been called putrid sore throat, Bark will, in many instances, be found very efficacious. But to be useful, it must be used judiciously. "It is in the latter stages of the disease, where there is great prostration of strength, with symptoms of malignancy and putrescency, and a tendency to gangrene in the throat, that it is undoubtedly calculated to do good."—*Eberle*.

In Hæmorrhages Bark has also been employed. There are cases of passive hæmorrhages, a frequent instance of which occurs in menorrhagia, and in low fevers, or in scurvy, where the efflu-

sion depends upon a laxity of the extreme vessels. Here the Bark is the most proper remedy, and when the remote or exciting causes of the disease can be avoided, a very effectual one.

The Cinchona has been, and is constantly employed, in a great variety of diseases, which I shall not attempt to enumerate. The general operation of this valuable article, is, to restore and increase the general health and strength, to improve the appetite, and promote all of the functions of the body. This it effects in a gradual way, and mostly without any sensible operation, except that of strengthening the pulse.

Besides the original use of Bark in intermittents and remittents, it is scarcely less extensively or certainly useful as an auxiliary to surgery, in supporting and improving the vis vitæ under extensive bodily injuries, large ulcerations, compound fractures, and cases where gangrene is threatened or actually established.

These operations, to proceed in a favorable manner, require a certain degree of vital energy. It is, therefore, in the case of atony, or defective action, that the Bark should be employed, in order to bring on that degree of inflammation so necessary for the secretion of good pus, or for resisting the progress of gangrene. The necessity for this practice frequently occurs after amputations, where the pulse becomes weak and frequent, with anxiety about the precordia, a pallid redness in the diseased parts, together with the effusion of a thin, serous fluid from the surface. In such cases, by the use of Bark, the pulse becomes stronger and fuller, the colour in the diseased part gradually improves, and a mild and well digested pus is prepared. In gangrene, it is equally remarkable to perceive the immediate and good effects from the use of Bark, which, by producing a necessary and salutary degree of inflammation, occasions the gangrenous parts to separate from the sound, and the progress of mortification is checked. With these remarks, I conclude the application of Bark to diseases, and shall consider the forms of its Exhibition.

*The Forms of Exhibiting Cinchona.*—From the very extensive use of Quinine in practice, it might be thought, that the remarks to be made upon the forms of administering Cinchona, would not occupy us very long. But I may state, that it is often necessary to give Bark in substance.

For though it must be admitted, that the febrifuge property of Bark is possessed by Quinine, and that in many instances it succeeds in relieving the patient, yet it has been observed, that in some cases the cures have not been permanent, and it has been necessary to resort to the Bark in powder—relapses being less frequent by this practice.

It has, too, been observed, that Quinia cannot be substituted for Cinchona as a tonic.



I shall, therefore, speak of the several modes of administering this article, since it may be occasionally necessary to resort to them.

Cinchona is exhibited in medicine in a variety of forms. The Powder is the most efficacious, and is at times the only form which can be depended upon for the cure of intermittents, and many other diseases that require the vigorous use of this medicine. The great inconvenience attending the powder, is the extreme disgust which it is apt to give to sick persons, partly from the taste, which is nauseous, and partly from the mere bulk and quantity of impalpable powder which must be swallowed.

This disgust too, does not always go off, but as often increases by use. The disagreeable taste and feel of Bark in the mouth, may be considerably checked and corrected in various ways.

A cup of coffee with sugar and milk, will bear the addition of a dose of the powder, with very little alteration of the taste, if taken immediately on mixture.

Red wine is often used as a vehicle—or water, with a small quantity of brandy or warm tincture.

Liquorice is generally thought to cover the taste most effectually, or the powder may be made into an electuary with syrup, and a lump of this, equal to the required dose, may be wrapped in wafer paper and swallowed.

To render the Powder more agreeable—It is united with various aromatics, as cloves, cinnamon, or the powdered serpentaria—and to this, some alkaline salt is added, as tending to make the active principles of the Bark more soluble—as in the following combination.

R. Powdered Bark,	℥ss. to ʒi.
Powdered Nutmeg, Cloves or Cinnamon,	℥ss. to ℥ii.
Carbonate of Soda,	℥ss. m.

And divide into 4 or 6 Powders—one to be taken every two hours.

When it happens that the Bark cannot be taken in this form, we are obliged to resort to some other, and the

Decoction is then used. It is prepared in the following manner.

R. Bark of Cinchona bruised, ʒi.

Water, xvj.—boil for 10 minutes, and at the close of the boiling,\* add

Bruised Serpent. Root, ʒii.—let it stand for an hour and strain—add

Tinct. Cinchona, ʒiss.—Dose ʒi. every 2 hours.

Always to a Decoction of Bark, or other vegetable substance, unite a portion of the Tincture, as in this manner we combine the active principle of the article. Before using, it should be shaken,

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\*Long boiling converts the Tannin into oxidized extractive, which precipitating, carries down with it much of the Kinates.

that the sediment which subsides when cold, be again mixed with the clear liquor, for it contains a large proportion of the Kinates.

This is undoubtedly the best substitute for the Powder, if it is taken in a large quantity.

The Infusion is another form of exhibiting Bark. It is made by macerating 1 part of Bark with viii. or x. of water—for 5 or 6 hours. Water at a given temperature seems capable of dissolving only a certain quantity, and therefore we are not able to increase the strength of the Infusion, either by employing a larger quantity of the Bark, or allowing it to remain longer in contact. To accelerate the action of the water, it is usual to pour it boiling hot on the Bark—to cover it up, and allow it to cool slowly. After standing a certain time, the Infusion is decanted off for use. The Infusion is liable to a very great objection; it cannot be kept even a very short time without being decomposed and spoiled. It is best adapted to the first stage of the chronic state of Fever, and to those stomachs which are weak and delicate. It would certainly be the most suitable form in diseases of children, in which this medicine is indicated. But water being incapable of dissolving the resin, and very little of the alkaloids, in which the power of Bark is contained, the Infusion is not so efficacious when the whole energy of the article is required.

The Infusions in boiling water acidulated with sulphuric acid, are preferable preparations. With the Infusion, as the Decoction, the sediment which forms after it has been decanted, should be mixed with the clear fluid before being taken.

Of the Tinctures. The Tinctures of Cinchona contain all the active principles of the drug—the alcohol dissolving all the Kinates of the Alkaloids.

But though proof spirit extracts much of the virtue of Bark, no quantity of Tincture that could be borne without intoxication, could be depended on in diseases where the Cinchona itself was the proper remedy. The Tincture, therefore, is only an auxiliary medicine, and is principally employed as a stomachic mixed with the Decoction.

Two Tinctures are in common use—the Simple Tincture, made merely with the Bark and proof spirit—and the Compound, in which the Cinchona is combined with serpentaria and with orange peel.

Extracts—Are made with water and alcohol—the latter being most active. They are seldom, or never, employed at the present time.

Adulterations of Cinchona. Practitioners should not purchase Bark in the state of powder—as in this state, it is always more or less adulterated. Adulterations are frequently practised by uniting with Bark of a good quality, others of an inferior.

Another fraud consists in the admixture of the powder of Bark which has been employed in making the extract, or from which the quinine has been obtained, with such as is of a good quality.

The last and the best of the preparations, are the Neutral salts of the alkaloids.

The principle obtained from the Yellow Bark has been called kinine, and from the sulphuric acid being employed in its preparation, it unites to the alkaloid, and a sulphate of kinine is obtained. This article is thought to possess the active properties of Cinchona in a concentrated state—and from the small dose required, together with its comparatively pleasant taste, it has been retained upon the stomach, and been productive of the happiest results, when the Cinchona, in substance, would, in all probability, have been attended with considerable inconvenience. It is applied to the same diseases as the bark—intermittent and remittent fevers—and from its small bulk, as well as agreeing generally with the stomach, may be employed earlier than the bark has usually been resorted to. In these fevers it has been employed very extensively in the hospitals of Europe and in this country, and the success which has followed its use, has been very considerable.

In this country its use has afforded much satisfaction, and we are warranted in stating it as superior to bark in many respects. It is preferable in the fevers of children, and from its prompt operation in their cases, I think, particularly with the facility with which it may be administered, it is no doubt a valuable discovery.

As a tonic it is also employed, but with effects not equal to those of bark. The sensible qualities of kinine are similar to those of Cinchona, its bitterness being more intense.

The dose of this article is from one to two grs. every 2 hours during the intermission or remission of the fever in half a wine-glassful of water—or in porter—or in pills—or in an infusion of any of the aromatic bitters—as gentian root—orange peel—or cascarilla.

Dr. Elliotson recommends giving a large dose, x. grs. for instance, either before or after the paroxysm.

An objection to the use of quinine in large doses, is, its tendency to affect the head—producing in some cases vertigo, tinnitus aurium, flushed face, bleeding at the nose, mental delusions, and such symptoms as are called by the name of “Quininism.” This may sometimes be the effect of the large doses employed.

The doses have varied from one to ten grs.—one gr. of quinine is equal to 3i. of Cinchona.

In Italy it has been given in larger doses. Dr. Martinet, who practises near Pisa, has been obliged to give *thirty-five* grs. repeated in the intervals of fever without producing any bad effect.

In Italy much confidence is placed in Cinchona. The daily



average of the consumption of bark in the Hospital of the Holy Ghost, amounts to about fifty pounds.

The quantity consumed in Italy in a year, was ten thousand, two hundred pounds.—*Sigmond.*

Quinine is frequently adulterated. We discover such as is of good quality by the following characters.

1. When exposed to heat, on a slip of platina foil, it melts like wax.

2. It is very sparingly dissolved by water, more so by hot than cold.

3. It is much more soluble in alcohol.

4. Iodine has a remarkable effect upon it. A gr. of iodine heated in a dram or two of water, produces in a watery solution of the sulphate of quinine a copious precipitate of a cinnamon brown color.

5. Sensible qualities, strong bitter taste.

Cinchonine. A few words may be said upon the other alkaloid substance found in bark.

Cinchonine has been employed as a tonic and febrifuge by Dr. Chomel—but it must be remarked, that these properties are in a much less degree in this alkali than in quinine. In certain cases the febrifuge effect has completely failed. It is desirable, therefore, that physicians should make new observations on this substance, which is found united with quinine in nearly all the barks, and exists alone in Carthagena bark. Dose the same as the preceding.

Extract of Quinine. This is the residuum which remains after extracting quinine from Cinchona. It is a super-sulphate of quinine with colouring and extractive matter—the dose is 2 grs.

Compound Tonic Extract—Is also another mode of administering quinine. It is a valuable preparation, and consists of quinine—cornine—piperine—oil of black pepper—capsicine united in equal proportions.

The dose is a gr., and, according to Carpenter, is one of the most valuable preparations in the treatment of intermittent fevers.

Cinchona has also been employed in the form of a bark jacket and glyster—but is seldom resorted to at present.

With these remarks, I complete the Therapeutical applications of Cinchona.

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*Pinckneya Pubens*—*Georgia Bark*.—Nearly allied to the cinchona in virtues and general character, is the present article. In these respects, its relation is so intimate, that it might very well be included in the same genus, but differences having been noticed, though probably not very material, it has been removed into a separate one by the elder Michaux, and the present title bestowed upon it, in honor of the late Gen. C. C. Pinckney.

This plant grows in the most southern parts of the Union, on the banks of the St. Mary's river, in Florida and Louisiana. The specimen which I show you, was obtained about 12 miles from the city, where it was planted by Michaux in a garden formerly cultivated by him. It flourishes very well, though placed in a soil not well adapted to it, nor a climate altogether congenial to its nature.

The P. P. or Georgia Bark is a low tree dividing itself into numerous branches, and rarely exceeding the height of 25 feet, and the diameter 5 or 6 inches at the base. A cool and shady situation appears the most favorable to its growth. Its leaves are opposite, 4 or 5 inches long, of a light green colour, and downy underneath—as are also the shoots to which they are attached. The flowers, which are white, with longitudinal rose coloured stripes, are pretty large, and are collected in beautiful panicles at the extremity of the branches. Each flower is accompanied with a floral leaf, bordered with rose near the upper edge. The capsules are round, compressed in the middle, and stored with a great number of small winged seeds.

The wood of the Georgia Bark is soft and unfit for use in the arts, but its inner bark is extremely bitter and appears to partake of the febrifuge virtues of the cinchona, for the inhabitants of the southern parts of Georgia employ it, according to Michaux, successfully in the intermittent fevers which prevail during the latter part of the summer and autumn. A handful of the bark is boiled in a quart of water till the liquid is reduced one-half, and the clear fluid is administered to the sick. This is all that I know of this article, and my information has been derived from Michaux's *Sylva of N. America*. The further investigation of this subject is a matter of considerable interest, and to gentlemen residing in that part of country where it is to be found, the investigation of its properties with its application, together with its effects, would afford a very good subject for an experimental dissertation.

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*Family Aristolochiæ—Aristolochia Serpentina.*—Nearly allied to the bark in many of its properties, is the *Aristolochia Serpentina*—common terms, Virginia or Small Snake-root. This is one of the many native tonics with which our country is enriched, and from being frequently combined with bark, may, with propriety, succeed to the consideration of that article. The root, which is the part used, is perennial and composed of a number of fibres proceeding from a common trunk, externally brown and internally whitish. It has an aromatic smell, and a warm, bitterish, pungent taste, which is not easily concealed or overpowered by a large admixture of other materials. It gives out its active matter both to water and rectified spirit, and tinges the former of a deep brown, and the latter

of an orange colour. On distillation, a white, pearly fluid collects in the receiver, very strongly impregnated with the aroma, but less bitter than the root. This fluid, on standing, deposits round the edges of its surface small crystals of camphor, which are said to be pure.

The *Serpentaria* is to be found in all the Southern section of the United States, and was first recommended as a medicine of extraordinary power in counteracting the poisonous effects of the bites of serpents. That it possesses no power in this respect, you need not be informed at this period of our knowledge of the plant; but in lieu of this, exhibits other and valuable properties, which renders it a useful and often indispensable article in our conflicts with disease. Its medicinal properties are tonic and diaphoretic, and for these it has been extensively used in fevers of various descriptions, and been commended by most medical writers. Possessing stimulating properties in a considerable degree, it is improperly exhibited in the early stages of disease, and during the existence of inflammatory symptoms. When these have been subdued, and a medicine is required which excites the vessels of the skin, strengthens and improves the tone of the digestive organs, it will be found to accomplish our wishes very fully. In fevers of a typhoid type, with much attending debility, it may be also advantageously employed, given alone, or in combination with camphor, the sweet spirits of nitre, or other stimulating diaphoretics. It will be found useful in supporting the strength, and allaying the irregular actions which attend great febrile debility, as subsultus tendinum, delirium, watchfulness. It may be given as in the following formula.

℞. Infus. Rad. Serpent., ℥vj.  
 Gum Camphor,        ℥i.  
 Spts. Nit. Dulc.,     ℥ss.  
 Tinct. Serpent.       ℥ss. m.

A tablespoonful every two hours.

In Remittent fevers, accompanied with determinations to the liver, or lungs, and connected with symptoms of a typhoid type, it may be beneficially resorted to. In the Remittent fevers of children, I have employed the Infusion of *Serpentaria* with the sweet spirits of nitre, as a tonic and diaphoretic, and have been much pleased with the combination.

In Intermittent fever this article has been recommended—but its efficacy in the cure of this disease cannot be much relied upon, given alone. When combined however with bark, its powers seemed to be increased, and in this way it is most commonly employed in the treatment of this disease. In short, the operation of both articles seems to be improved by this union, and the for-



mula employed I have already mentioned. The formula is as follows.

R. Powdered Cinchona,  $\text{ʒss}$ .

Powdered Serpent.,  $\text{ʒi}$ .

Carbon. Soda,  $\text{ʒss}$ . m.—to be divided into 4 powders—one to be taken 4 times a day.

Why this compound should have such peculiar powers, it is not easy to explain, but the fact is not less certain.

Serpentaria is a popular remedy in exanthematous disorders, being given to keep out the eruption, and to restore it when it has receded. It is, however, too stimulating to be used with propriety, and in many cases rather aggravates than relieves the disease.

There is yet one other affection in which this medicine is employed with the happiest effects, viz. in that irritable state of the stomach occurring either in bilious, or other fevers, or as an idiopathic affection. Given in these cases, in the form of an infusion taken cold, it will be found very grateful to the stomach, and succeed in checking emesis after other means have been unavailingly employed. Dr. Rush, it is said, owed his life to this medicine after an attack of bilious fever, when nothing else would allay his vomiting.

Forms of Exhibition. The most common form of exhibiting the Serpentaria is in infusion, for which purpose  $\text{ʒii}$ . may be steeped in a pint of boiling water in a covered vessel. Of this infusion  $\text{ʒss}$ . to  $\text{ʒi}$ . may be taken every 2 hours. This is the best form of administering it, as by decoction its volatile parts are dissipated, and of course the value of the preparation is impaired. Sometimes the powder is given in doses from ten to thirty grains. A tincture is made by digesting an ounce of the root in a pound of spirits, and it will often be found a very useful stomachic. The compound tincture of bark, commonly called Huxham's tincture, contains Serpentaria as one of its ingredients. It is prepared in the following manner.

Peruvian Bark,  $\text{ʒii}$ .

Orange Peel,  $\text{ʒss}$ .

Snake Root,  $\text{ʒiii}$ .

Saffron,  $\text{ʒi}$ .

Proof Spirit,  $\text{lbii}$ .—in digest for 14 days and strain.

This will be found a very useful and pleasant tincture, either alone, or in combination with other articles. With these remarks, I conclude the consideration of two of the most active and extensively useful tonics of the M. M.

I proceed with the consideration of the articles of this class, and shall prosecute the enumeration of our Native Tonics.

Many of these bear a considerable relation to the cinchona officinalis both in their chemical analysis, and application, and may with great propriety be substituted for that article. In this class of remedies Nature has been particularly bountiful—in no other can we discover so great a variety, or so many valuable plants. It has been a common remark, that every country possesses an antidote to its diseases. The remark is not inapplicable to our situation. If in our swamps and marshes we have fertile sources for their production and generation, we have in our forests the means of invigorating and supporting the system under their attacks—and if in our vallies Nature has sowed the seeds of disease, she has on our hills planted the Corni—the Pruni—the various species of oak, &c.

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Of this valuable class, the first which deserves attention, is the *Cornus Florida* or *Dogwood*.

*Family Hederaceæ—Cornus Florida* or *Dogwood*.—It is the largest and most splendid of its genus, and is to be found in all the Southern section of the U. S. It is very conspicuous in spring, from the size and number of its flowers and from their early appearance. It grows on the borders of swamps, and rarely in the pine-lands, where the soil is too dry and sandy to support its vegetation.

The bark, which is the part employed, is rough externally, and of a brownish colour within. Its taste is a strong bitter, with some astringent and aromatic flavor, a combination which characterises our best tonics—the bark of the branches should be preferred to that of the trunk.

In its chemical composition it is nearly allied to the cinchona, consisting of an extractive substance, tannin, gallic acid—and a small portion of resin. From it also has been obtained an alkaline principle, similar to the quinine or cinchonine. It was discovered by Carpenter, of Philadelphia, and by him called Cornine. It is used in the form of a sulphate in the same cases, and in similar doses as the sulphate of quinine. A given quantity of the bark yields but a very small proportion.

Medical application. As may be inferred from the preceding remarks, it is employed in the same cases to which bark is applicable—Intermittent and Remittent fevers, and several cases may be mentioned of these diseases being cured.

Dr. Gregg, of Pennsylvania, states, that after employing the *Cornus Florida* habitually for 23 years, in the treatment of Intermittents, he was satisfied that it was not inferior to the Peruvian bark as a means of cure in such cases—and among the number of cures by this medicine, was his own case.

It was taken in decoction to the amount of several ounces, which effectually removed the disease, but produced some pain

in the bowels, rendering a recourse to laudanum necessary. This property of affecting the bowels with pain, it is found to possess only in its recent state, and never after it was a twelvemonth old did it disagree either in exciting pain, or in producing a cathartic or emetic effect. It should, therefore, be well dried and pounded before it is used.

In powder it may be given in the same diseases, in doses rather larger than the cinchona, either alone, or combined with serpentaria, or any of the usual combinations with that article.

In Remittent fevers it may be employed as the bark has been recommended, and *as it is less stimulating*, it may be resorted to advantageously at an earlier period in the disease than is safe or prudent to commence with that article. Besides these diseases, it may be used as a corroborant or strengthening medicine in cases of general debility, and in short for most purposes to which the cinchona is applied.

In some respects the Cornus is preferable, as there is but little inducement to practice adulteration, it may often be more relied upon than the usual preparations of bark which are sold under that name.

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*Cornus Sericea*—*Swamp or Red Dogwood*—Possesses properties so nearly allied to the Florida, that it does not require a separate consideration.

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*Cornus Circinata*—*Round-leaved Dogwood*—Possesses the same properties. It is highly valuable as a tonic, and stomachic—and appears to be largely in use in some parts of the U. S., particularly in Connecticut, where it is employed as a substitute for cinchona, and has become an officinal article. It grows from Canada to Pennsylvania, and is much commended by the physicians of New England, who speak of it as possessing virtues equal to the Pale Peruvian bark, *C. Lancifolia*— $\text{ʒi.}$  of the bark yields, by boiling, 150 grs. of an intensely bitter extract.

The Corni are administered in powder, decoction, tincture and extract. The tincture has been employed in various instances of impaired appetite and digestion—and the report of those who have taken it, is as favorable as the preparations from the imported tonics of the shops. A decoction of the buds and twigs has also been employed, and it is said to agree better with weak stomachs than the other preparations. The extract is *less bitter* and *more astringent* than that of the best cinchona, but preferable to the extract of the inferior kinds.

I have thus presented you with all the facts known relative to these valuable plants, and can with confidence recommend them to you as substitutes for the Peruvian bark. To those who prac-



tice at a distance from the sea-board, it must be a source of much satisfaction to know, that a substance capable of doing so much good, exists so widely diffused through our forests.

*Family Simarubaceæ—Simaruba Amara, and Quassia Excelsa.* The trees rise many feet in height, and send off strong branches—the wood is white and light—the bark is thin, and of a grey colour. It is a native of Surinam, a province of South America, and also of some of the West India islands.

It received the name of Quassia from a negro named Quassi, who first applied the roots of the tree to medicinal purposes. By his successful exhibition of it in the endemic fevers of that country, he acquired such reputation among his equals, as soon to be consulted by their masters, and thereby drew the attention of M. Dahlberg, counsellor of the province, by whose endeavors the tree was ascertained, and specimens sent to Prof. Linnæus, who introduced it into his public lectures on the M. M.

It was described by him as almost peculiar to Surinam, but subsequent enquiries have shown it to be indigenous to some West India islands, particularly the Carribean.

The root, bark and wood of this tree have all been comprehended in the catalogues of the M. M.—but as the roots are perfectly ligneous, they may, medically, be considered in the same light as the wood, which is now most generally employed—and seem to differ from the bark in being less intensely bitter.

Quassia has no sensible odor, its taste is that of a pure bitter, more intense and durable than that of almost any other known substance—and it imparts its virtues more completely to watery than to spirituous menstrua. This article is one of the most valuable of the bitter tonics. The virtues ascribed to it are those of a tonic, stomachic, and febrifuge. It is less heating and oppressive than most other substances of this class—and can be taken with impunity by many patients, in whom cinchona and the more powerful tonics bring on head-ache, uneasiness at the stomach, and febrile symptoms.

In cases of weakened tone of the stomach brought on by excesses in eating and drinking, and from constitutional causes, or a relaxed state of the nervous system, Quassia proves highly beneficial, and may be given alone, or, what is better, combined with an alkali or absorbent, or the mineral tonics.

In irritable states of the stomach occurring in temperate persons, when vomiting frequently occurs, not only of the food taken, but of the secreted fluids of the stomach—which states of the stomach are not unusual in persons laboring under hypochondriasis, or in females of delicate habits afflicted with chlorosis, leucorrhœa

and amenorrhœa—the infusion of this article will be found useful, combined with some absorbent medicine, especially when there is acidity present.

Quassia is administered in the form of infusion, or pills of the extract. The infusion is made by pouring a pint of warm water upon ʒi. of the rasped Quassia—and to a portion of this poured off, is added carbonate of potash or soda—or prepared chalk—and some aromatic tincture, to render it more palatable.

This article is probably one of the best specimens of a purely bitter substance which I can present to you. It possesses this advantage over most other vegetable infusions, of not being decomposed by the metallic salts—nor is it blackened by iron—hence it is a good vehicle for a variety of mineral tonics—not undergoing any change of colour. It is very useful for the several purposes I have mentioned, and is much improved by combination.

It is in every respect very valuable.

An infusion of Quassia, sweetened with brown sugar, is an effectual antidote for flies, and should be preferred to the more pernicious compounds.

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*Family Rosaceæ—Prunus Virginiana* of Michaux—and *P. Serotina* of Willdenow—the *Wild Cherry-tree*.—This tree grows to a considerable size, and is very extensively diffused over the U.S. It is associated with the trees of the forest, growing to the height of 40 feet and more. It produces in autumn a small, bitter cherry, black when quite ripe, which serves as food for birds, who frequently become intoxicated by eating them.

The bark of the tree, as well as of the root, is possessed of very considerable tonic properties, being bitter, astringent, and in some degree aromatic to the taste. It is also slightly narcotic, which is owing to its containing Hydrocyanic acid—as its smell resembles those substances which contain it—particularly the peach kernel, and upon this circumstance its good effects in some forms of disease which will be mentioned, depend.

The bark of the Cherry-tree is nearly allied to some of the preceding tonics, both in its sensible and chemical properties—and like them, has been frequently substituted for the Peruvian bark. When taken into the system, it produces a slight increase of the action of the heart and arteries, and in some individuals, is followed by a degree of drowsiness. This, however, soon wears off, and more permanent impressions succeed.

The Diseases in which it has been used. It has been highly recommended in the cure of Intermittents—and for this purpose has been much employed by the practitioners of this country.

Their reports are favorable to it, and it has been said to have succeeded after bark and the mineral tonics had been employed without advantage. It may be given combined with Dogwood bark, or alone, in substance, but most commonly in infusion.

In some complaints of the thorax, this article has been employed, and you may suppose with some prospects of advantage, containing as it does so large a proportion of Hydrocyanic acid in its composition. In phthisis, from what has been said of the effects of Prussic acid in that complaint, you will readily conclude, that in this affection it has been employed. In the advanced stages, attended with much cough, and hectic fever, with a considerable diminution of strength, it has been resorted to, and the effects derived from its use have been stated to have been satisfactory. Combining such rare properties, as a bitter and astringent principle, with a capacity of allaying irritation in the system, from the presence of Hydrocyanic acid, it might be supposed to be well adapted to the treatment of this disease. Its good effects would seem to depend upon its lessening the frequency and irritated state of the pulse, moderating the cough, and supporting the strength of the system. For its utility in these cases, there is sufficient authority for recommending it strongly to your attention, and if, in the advanced stages of the disease, it does not cure, it will at least allay the distressing symptoms, and secure you the esteem of your patients. This is a point of no small consequence, and it is not from that alone that I urge it upon you, but the responsibility which I feel attached to my situation, to direct your attention as much as possible to the resources within your reach.

In Asthma it has also been spoken of, and from the tenor of the preceding remarks, it may be employed advantageously---either in the pituitous and spasmodic, with equal advantage. In a very severe case of this disease which fell under my notice, in which the paroxysms were long and violent, the patient after trying the usual anti-spasmodics without much benefit, had recourse to this article in the form of a very strong infusion---and by persisting in its use for a long time, considered that he derived permanent benefit from it, and appeared much improved when I conversed with him some time after.

Besides these diseases, it has been used as a tonic in dyspepsia---in cholera infantum---in chronic diarrhœa---and in these cases may be beneficially employed.

The Forms in which it is exhibited. It may be given in powder, or in strong infusion, or tincture. In decoction, which is the most usual mode of administering it, its virtues are much impaired, as by boiling the Hydrocyanic acid is driven off. The dose of the powder is  $\mathfrak{ss}$ . to  $\mathfrak{iii}$ .---and of the infusion, a wineglassful repeated as often as the stomach will bear.



Very good effects are produced by washing ill-conditioned ulcers with a decoction of the bark.

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*Family Synanthereæ—Eupatorium Perfoliatum—Thoroughwort.*—This article has been already treated of under the head of Diaphoretics---but it also exhibits considerable tonic properties. Its virtues in this respect have been spoken of very favorably by Dr. Anderson, of New York, and by him it has been considered as possessing properties similar to those which characterise the cinchona officinalis---and that it will not suffer by comparison with any of the articles drawn from the vegetable kingdom.

It has been employed successfully in the treatment of intermittent fever, and several cases are related as being cured by this article alone, after previous depletion. Such, in short, was the benefit derived from it, that it was administered in almost all cases of intermittents which occurred in the New York Alms-house in the year 1812, to the exclusion of the Peruvian bark.

It is given in powder in doses of 20 or 30 grs., or in a strong decoction taken cold. A tincture of the flowers and leaves is also prepared, and as it is a pleasant and convenient form, it is also the most powerful.

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Nearly allied to this is the *Eupatorium Pilosum* or *Wild Horehound*.

This article grows wild in abundance in the Southern States, and has acquired much reputation as a domestic remedy in the prevailing fevers of our climate.

It serves as an excellent tonic during the stage of convalescence after an attack of fever, and from its mild and not unpleasant properties, agrees better with the stomach than the cinchona. As it is diaphoretic, it may be resorted to with much advantage earlier in the disease than the bark would be admissible.

It is usually given in the form of infusion. An ounce of the dried leaves infused in a quart of water, and of this a wineglassful may be taken 4 or 5 times a day.

With these views, I have prescribed it very frequently, and have been well pleased with its operation. As a tonic, in the weak and depraved states of the stomach, it has also been much employed, and in these cases it often exhibits very good effects.

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*Family Gentianeæ—Gentiana Catesbæi—Blue Gentian—Sampson Snake-root.*—This is one of the various species of Gentian our country affords, and it approaches very nearly in its properties to the imported article. Several of these approach very near to the officinal root in bitterness—but none are so closely allied to it as the

present article. It is called *Catesbæi* in honor of Catesby, who first described it about 80 years ago.

Root branching and fleshy. Stem erect, simple.

Leaves opposite, ovate, lanceolate.

Flowers crowded, neatly sessile, axillary and terminal.

Segments of the Calyx—linear, lanceolate, varying in length, exceeding the tube, and sometimes more than twice its length.

Corolla—large, blue, plaited, border ten cleft.

Stamens, five.

The dried root of this vegetable has at first a mucilaginous and sweetish taste, which is soon succeeded by an intense bitter. This quality appears to reside in a bitter extractive principle, soluble in water and alcohol. The decoction is nearly equal in bitterness to the tincture, and both these solutions exhibit this property in a much more powerful degree than the root in substance.

This article has become familiar to us, and I believe we are principally indebted to the late Dr. McBride for its introduction into notice. By him it was considered a tonic of considerable efficacy, and that it was applicable to all cases of impaired digestion, connected with a debilitated state of the system generally.

In the form of decoction, it is used with decided advantage, in cases of pneumonia of a typhus character, as in addition to its tonic powers, it is well calculated to excite perspiration.

In the form of tincture, it is much esteemed in dyspepsia, given in doses of a dram or half an ounce.

In this manner administered, it increases the appetite, prevents the acidification of the food, and enables the stomach to bear and digest articles of diet which before produced oppression and dejection of spirits.

This article is very much employed by the common people, and is useful on many occasions as an agreeable tonic.---*A. Med. Botany.*

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*Family Gentianeæ—Chironia Angularis*, or more properly *Sabbatia Angularis*—or *Centaury*.—This plant grows in rich, damp soils, throughout the Middle and Southern States, and is commonly known by the above name. It is usually from one to two feet high. It is said to be one of the most useful and agreeable of our vegetable bitters, and is decidedly more valuable than the *Centaury* of Europe. Every part contains a pure, strong bitter, possessing a slight aromatic flavor, which renders it less offensive to the stomach, and which properties it communicates to water and alcohol.

It has, therefore, been employed with advantage in domestic practice, and with benefit in some febrile affections. In these cases it exhibits its good effects very speedily, in invigorating the stomach and digestive organs, and restoring the appetite. It is given in

the form of a strong infusion, of which a teacupful is taken frequently.

With this article I conclude the description of our Native Tonics—though there are many others which have been spoken of in high terms, and which possess valuable properties. I will simply enumerate them, and a further acquaintance with these articles can be prosecuted at your leisure. They are as follows:

*Liriodendron Tulipifera*—or Tulip Tree.

*Magnolia Glauca*—Sweet Bay, and White Bay.

*Fumaria officinalis*—Common Fumitory.

*Æsculus Hypocastaneum*—Horse Chesnut.

*Humulus Lupulus*—Common Hop.

*Zanthorhiza Apiifolia*—Yellow Root.

*Frasera Walteri*—American Columbo.

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*Family Synanthereæ—Anthemis Nobilis*—or *Chamomile*—Is a native of the South of England, is perennial, and grows well in poor, sandy soils. All parts of the plant might properly be employed, though the flowers are the part made officinal, and of these the single ones are somewhat the strongest in their sensible qualities. To the taste the plant is bitter and aromatic, but the flowers possess these properties in the highest degree.

Chemical Analysis. 1. A volatile oil, which gives to the flowers their aromatic quality, and which can be separated by distillation.

2. A fat, concrete matter, in conjunction with which piperina is found to exist.

3. Bitter extractive.

4. Tannin and gallic acid.

Chamomile is among the most ancient articles of the M. M.--- having been employed by the Egyptians as an external application in the cure of Fevers, and being often referred to by Dioscorides and Theophrastus, physicians of Greece.

The flowers are much employed for their tonic and stomachic qualities, and for these purposes are more frequently resorted to than any other article of the M. M. Indeed, their mildness, together with their agreeable bitterness to many persons, renders them particularly adapted for improving the impaired and debilitated condition of the digestive organs.

Besides these cases, they have been considered as a good substitute for the Peruvian bark in the cure of Intermittent fevers, and their efficacy in this respect has the testimony of several respectable physicians. Dr. Cullen speaks favorably of their use in these cases, given during the intermission, in doses of ʒss. to ʒi. of the powdered flowers.

They are most beneficially employed in the convalescent stages



of this and other fevers, and their operation does not extend further than improving the appetite and strengthening the stomach.

Besides these diseases, the flowers in the form of cold infusion, are useful in allaying bilious vomiting, and lessening the irritability of the stomach. Thus employed in these cases, they are grateful to the taste and feelings of patients, and will, in many cases, be found effectual in checking the retching, and sickness, which are so distressing.

They are often employed as an external application, in the form of fomentation, to inflamed tumors, to local pains, and as a discutient---for these several purposes they are very useful.

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*Anthemis Communis*.—There grows in this country a species inferior to the imported---the *A. C.*---but which, by cultivation, might be much improved. The flavor is not so agreeable, but its bitterness is more considerable.

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*Family Gentianeæ*—*Gentiana Lutea*.—The next of the vegetable tonics deserving of attention, is the *Gentiana Lutea*---Yellow Gentian. This plant is a native of the Alps, and is brought to us from the mountainous parts of Switzerland and Germany. The root is the only part which is used.

Root perennial, long, cylindrical, externally brown, internally yellowish.

Flower stem strong, smooth, erect, tapering, and rises two or three feet in height.

Leaves spear shaped, large, entire, ribbed, sessile and pointed.

Flowers large, yellow, produced in whorls.

Calyx, a membranous, deciduous spathe.

Corolla divided at base into 5 or more long, narrow segments.

Filaments vary from 5 to 8---long, conical, without a style and furnished with two reflexed stigmas.

Flowers in June and July.

Its active properties are extracted by water, spirits, and wine, though not in so great a degree by water as by spirit, and the extract prepared from the watery infusion, is also less bitter than that made from the spirituous tincture. The name Gentian is supposed to be taken from Gentius, King of Illyria, who first discovered its uses. This article is probably one of our most simple bitters, as it possesses no astringency, and is generally very grateful to the stomach. It is much employed by physicians, and as the bitters have been generally admitted to be not only *tonic*, but *stomachic*, this root has a better claim to the possession of these powers than most of its kind. It has, therefore, been much employed in dyspeptic affections, in the convalescence of fevers, and other cases of debility, where our object is to give tone to the

stomach. In the former disease, or dyspepsia, it is very much employed, either alone, or more frequently in combination with other remedies, and it is the basis of most *stomachic* preparations. It should be observed, that these complaints are often more effectually relieved by articles purely bitter, than the Peruvian bark; and hence may be inferred their superior powers on the organs of digestion.

It was once much used in Intermittent fevers, and Dr. Cullen speaks favorably of it in combination with galls, and he says, that he constantly succeeded in curing Intermittents with it, given in sufficient quantity—but its use is now superceded by the cinchona. Besides these diseases, it has also been much recommended in gout, particularly in the convalescent state, when much debility of the stomach is present, and it entered largely into the composition of the Portland powder, which was once much employed for keeping off the paroxysms of gout.

As a simple bitter, the Gentian is rendered more grateful to the stomach by the addition of an aromatic, and for this purpose orange peel is commonly employed. A very pleasant and useful formula for administering this article, is the following.

Take of Gentian root sliced,	℥ii.
Dried orange peel,	℥i.
Cardamom seeds bruised,	℥i.
Proof spirits,	℔ii.

Macerate for 14 days in a gentle heat and filter—the dose ℥i. to ʒss.

This preparation will be found very useful as a tonic and stomachic, and may be very successfully resorted to when such an object is to be obtained. Stoughton's elixir, or bitters, is the same preparation with the addition of serpentaria.

The Gentian is also given in the form of infusion, which is a very good preparation, and the extract. The powder is rarely used. From this substance an alkaline and active principle can be obtained, called Gentianin.

The extract is usually employed as a vehicle for the exhibition of the metallic substances, especially chalybeates, in the form of pill. The dose is from x. grs. to ʒss.

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*Family Menispermæ—Menispermum Palmatum—Colomba Radix—Colombo Root.*—Of this article the natural history is far from being well ascertained. It was commonly thought to be a species of *Menispermum* or Moonseed—but now determined to be produced from the *Cocculus Palmatus*.

It grew originally on the continent of Asia, and was from thence transplanted to Ceylon in the E. Indies, where it flourishes well, and has received the name of Columbo from the principal town

of that island. The root, which is the part employed in medicine, comes to us in circular pieces, which are from half an inch to 2 inches in diameter, and divided into transverse slices from an eighth to a quarter of an inch in thickness. The sides are covered with a thick, corrugated bark, of a dark brown hue externally, but internally of a yellow colour. There are three distinct parts composing the root—the cortical, which, in the large roots, is a quarter of an inch thick, the ligneous about half an inch, and the medullary which forms the centre, and is near an inch in diameter. It is much softer than the other parts, and when chewed seems very mucilaginous. It has an aromatic smell, but is also disagreeably bitter and slightly pungent to the taste. Both water and alcohol extract its bitterness. On chemical examination, M. Planche found it to contain a peculiar substance like animal matter, a yellow substance of an intensely bitter taste, about one-third of its weight of fecula, and a small portion of volatile oil.

**Medical uses.** Colombo is a mild but powerful tonic, communicating vigor to the stomach when properly administered, without producing stricture, nausea or oppression. It is extremely useful in dyspeptics, where a languid state of the stomach exists, attended with want of appetite, indigestion, nausea, and flatulence—and it has been said that cases of enfeebled digestion bear this substance with advantage, when most other tonics disagree. It may be given either in substance with some grateful aromatic, or infused in Madeira wine, and during the use of it, gentle doses of the tincture of rhubarb, or any other strengthening purgative, should occasionally be prescribed.

Habitual vomiting, when it proceeds from weakness or irritability of the stomach, from irregular gout, or other causes, is much relieved by the use of Colombo root in conjunction with aromatics, chalybeates, or the testaceous powders.

In that highly distressing state of the stomach which occurs in the early stages of pregnancy, where nausea and sickness are the constant attendants of the early morning, where the sight of almost any food is very apt to produce vomiting, and where the want of appetite, or a depraved desire for food occurs, I have very constantly recommended the Infusion of Colombo with great relief to the patient, more particularly when the bowels are kept in a gently relaxed state by magnesia, which, combined with the acid of the *primæ viæ*, becomes gently purgative.—*Sigmond*.

It is spoken of in high terms by the writers on East India diseases, in cholera morbus, in bilious diarrhœa, and other affections where there is an inordinate secretion of bile, for alleviating tormina, checking the vomiting and purging, and quieting the inordinate motions of the bowels. It is but little employed for this purpose in this country.



Such are the principal diseases in which this article is employed. It is administered in powder, infusion and tincture—the first of these forms being commonly preferred. The tincture is, however, a pleasant preparation. A very useful tonic is prepared with this article in the following manner.

R. Gentian root,	ʒi.
Colombo root,	ʒi.
Cinchon bark bruised,	ʒi.
Cardamom seeds,	ʒss.
Best Brandy, or other spirits,	℥i.

Macerate for several days and strain—to which may be added some of the Comp. Spirit of Lavender, and the Wine of Iron, in nervous and delicate habits.

The dose of the powder is from grs. xv. to ʒss., that of the infusion ʒiss. to ʒii. It may be given in combination with iron—with aromatics, rhubarb, or the saline purgatives, as may be required. The powder may be given with any aromatic tincture, as peppermint water, cinnamon tea, &c.

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*Frasera Walteri*—*American Colombo*.—There grows in this country a species of Colombo which has been said to equal the imported. It is a tall, rank, perennial plant, growing spontaneously in the Southern and Western parts of the U. S., particularly in Ohio. The root, which is large and fleshy, has a considerable degree of bitterness, and when cut in slices and dried, has some resemblance to the imported Colombo.

Owing to its comparative cheapness, it has been substituted in the shops for the imported article, to which, however, it is inferior, having less of the bitter principle. It is an article of some value, and it is probable, that by more attention to its cultivation, its properties may be improved.

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The last of the vegetable tonics which I shall consider, is the *Family Rutaceæ*—*Cusparia Febrifuga*—or *Bonplandia Trifoliata*—*Angustura Bark*.—The botanical history of this article was involved in much doubt and conjecture, until those enterprising travellers, Humboldt and Bonpland, met with it in New Guiana. A specimen was sent to Prof. Willdenow, of Berlin, who described it in the memoirs of the Berlin Academy for 1802, and named it, in honor of its discoverer, Bonplandia. It is a native of South America, and is frequent in the woods near Carony and Alta Gracia. It grows to the height of from 60 to 80 feet, of an elegant and majestic form. The bark is only one or two lines in thickness, and is sometimes cracked externally. As it is brought to this country, it is in flat pieces, of various sizes, having an external greyish and rough surface from its epidermis, and is internally of a brownish yellow colour,

having a very bitter, somewhat aromatic taste, and a very peculiar odor.

In its botanical character, it approaches most nearly to quassia, but is sufficiently distinguished from it, to prevent its being arranged under the same class. With the *Cusparia* another kind of bark is sometimes mixed, which is said to possess poisonous qualities. It is obtained from the *Nux Vomica* tree, having a coarse texture, and beset with blackish, warty excrescences—its powder is grey, and the infusion of a dirty brown colour.

Medical uses. This article, when first introduced, was extolled as a remedy in Intermittent fevers, and supposed to be sufficiently powerful to supplant the *Cinchona*. Subsequent trials do not confirm the statements which were then made, and though it is less liable to offend the stomach than that article, it will probably never take its place.

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*Family Gentianæ—Chirayta Gentiana—or Worm-seed Plant.*—Indigenous to the mountains to the westward of the Ganges. It is in long, cylindrical stalks, externally of a brown colour, but whitish within, of a very peculiar, bitter taste, without much aroma. It yields its power to water. Its properties are tonic. For further particulars, refer to Sigmond's Lectures.

#### MINERAL TONICS.

At the head of this class must be placed Iron and its preparations—and this, whether we consider the importance of its tonic effects, or the extent and variety of its remediate applications. Iron is found in great abundance in different parts of the globe, in combination with a variety of substances—as it is the most useful, it is also the most common of all metals. It seems to be even a constituent of organic substances and of the blood, and has hence been supposed to serve some important purpose in the animal economy. When given medicinally, the effects obtained from it are those of a tonic. It increases the vigor of the circulation, causes the blood to assume a more florid hue, promotes digestion, excites the secretions, or restrains them when they have been morbidly increased, and by its astringency, checks profuse evacuations, and counteracts the tendency to hæmorrhage. It is in diseases of debility that it is employed, and as its operation is only gradual, chiefly in chronic affections, as dyspepsia, hysteria, amenorrhœa, leucorrhœa, menorrhagia, scrofula, &c. In weak states of the constitution, characterized by a languid circulation, a pallid countenance, and other symptoms, Iron and its preparations will be found extremely useful. Such is the general character of this

metallic substance in its operation—and such the class of diseases to which it is chiefly applicable. There are some particularly, in which its good effects are more especially manifested, and these I shall enumerate.

As I have already mentioned, some of the preparations of Iron were employed at a very early period in hæmorrhage, and their good effects in these cases seem to depend upon their tonic and astringent operation.

Where the hæmorrhage depends upon general flaccidity, where the effusion of blood seems to be connected with a laxity of the animal fibre, accompanied with a pale and cachetic state of the system, Iron and its preparations are likely to be the most effectual remedies.

To give a particular instance of its efficacy in this species of hæmorrhage. Menorrhagia is often little more than a uterine hæmorrhage, and is frequently connected with a relaxed and debilitated state of the system, as paleness of the face, feebleness of the pulse, unwonted fatigue on exercise, swellings of the lower limbs, &c. To this may be added the chronic uterine hæmorrhagies which occur in females somewhat advanced in life, and when it occurs in the same habits, are to be treated with the same remedies. In these cases, the preparations of Iron are very useful, and may be given in combination with bark.

In retention of the menses depending upon a weakness of the vessels of the uterus, carried to the extent of producing chlorosis, Iron may be considered as a very useful remedy. In this affection there is usually a great want of tone, and activity, in every part of the system, and everything indicates languor and relaxation of the vital energies.

In Amenorrhœa connected with debility, and relaxation, the same remedy will be found useful. In these diseases Iron exhibits an aperient and astringent operation, according to the state of the constitution. Where the retention or suppression of the menses depends upon a weakness of the vessels of the uterus, the chalybeate medicines, by invigorating the force of the vessels, may cure the disease, and thereby appear to be aperient; and, on the contrary, in menorrhagia, where the disease depends upon a laxity of the extreme vessels of the uterus, Iron when exhibited, by restoring their tone, may show an astringent operation.

Besides these diseases, chalybeate medicines are often exceedingly useful in weakness of the stomach and bowels, combined with bitters.

The preparations of Iron have also been recommended in dropsy, and considerable success has occasionally followed their use. Iron has also been resorted to in other diseases of the class



Cachexia, as scrofula, rickets, &c. In some obstinate phagedænic ulcerations it is employed, and of late its use has been extended to the treatment of cancer. By Dr. Carmichael, of Dublin, the several preparations of Iron have been recommended in these affections in whatever part of the body they are situated—internally as well as externally employed. Many cases of the success of the practice are detailed in his work, and it is confidently stated, that the beneficial effects which follow their use, are an increase of appetite, an alleviation of pain, an amendment of the discharge, and an ultimate cure in many cases. The Carbonate is the preparation commonly preferred for internal use, and it should be given in small doses, and frequently repeated. As an external application, it is mixed with water to the consistence of a thin paste, with which the surface of the ulcer is covered, and the application is renewed twice in the 24 hours.

Where it does not cure, the treatment, it is said, seldom fails to produce ease, and a healthy discharge, to correct all fetor, and supersede the use of greasy and offensive applications. Such is a brief view of the practice recommended by Dr. C. Whether it is calculated to afford the benefits enumerated, more extensive and diversified experience with it is wanting in this country, before we can pronounce upon the value of the practice. One circumstance is necessary to its success, which is, that it be long and perseveringly employed. For further particulars, I must refer you to his work on cancer. I shall proceed to the preparations of this metal, and shall only mention such as are considered the most important, and fully capable of affording all the advantages which can be derived from chalybeate medicines.

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The first of these, is the *Limatura Ferri*—the *filings of Iron*.—Iron in its pure state proves active upon the system, and in the state of minute division, as that of filings, may be productive of good effects as a medicine.

That it undergoes solution, we know from the circumstance of its producing blackness of the stools, which affords the presumption of a previous solution in the acids of the stomach. Upon this preparation, I may observe, that it is rendered active by meeting with some acid, or other matter in the stomach, by which it is oxidized. As mechanical mischief may sometimes arise from metallic filings, it is surely preferable to exhibit the metal already oxidized, or in some of its soluble combinations, than to trust to the accidental solution of a portion of it in the stomach. We may, therefore, reject Iron filings as a preparation for internal use.

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The next is the *Sub Carbonas Ferri*—*Rubigo Ferri*—the *Carbonate* or *Rust of Iron*.—This is the metal oxidated by the action

of atmospheric air and water, and combined with carbonic acid, it is more active than the pure metal, and less irritating than the saline preparations.

When pure, it contains

1 atom of Carbonic acid,

1 atom of Protoxide of Iron.

It is prepared from the Sulphate of Iron in the following manner.

Take 4 lbs. of Sulphate of Iron,

4 lbs.  $\frac{3}{4}$  of Carbonate of Soda,

6 gals. of Boiling Water.

The Sulphate of Iron and the Carbonate of Soda are to be dissolved separately in three gals. of water, then the liquors being mixed together are set by, that the powder may subside—lastly, the supernatant fluid is poured off, and the precipitate in water, is washed and dried, and preserved in a well stopped bottle.

This is, perhaps, the best preparation of Iron in the majority of cases for which these medicines are thought necessary. It has but little taste, and generally agrees well with the stomach. It is apt to produce costiveness, and when this habit of body previously exists, it of course increases this state of the bowels to such a degree as to render it necessary to have recourse to some other preparation of Iron, or to combine it with some Cathartic, aloes being commonly preferred.

Besides its use as a general tonic in the cases in which chalybeates are usually employed, it has been used as a remedy in cancer by Dr. Carmichael, as I observed, and more lately by Mr. Hutchinson, in *tic dolooureux*. Ninety-eight cases, says Dr. H., the full reports of which I have before me, were cured by the use of the Carbonate of Iron—most of them after the persevering employment of other remedies. In this latter disease, it is recommended to begin with doses of from 2 scruples to a drachm, two or three times a day.

It is given in powder or pills combined with bitters and aromatics as a tonic, and with aloetics, valerian and myrrh, when directed more immediately to the uterine system, after the following formulæ:

R. Carbonate of Iron,

Powd. Ginger,  $\text{à g. v.}$ —m. for a powder.

To be repeated two or three times a day.

Or, Powd. Colombo—Carbonate of Iron—Powd. Ginger,  $\text{à 3i. m.}$  and divide into xii. powders—one 3 times a day.

Or, Carbonate of Iron, 3i.

Pil. Aloes and Myrrh, 3ss. m.—divide in Pil. xviii.

A pill to be taken 2 or 3 times a day.

With this article is also prepared the chalybeate wine—as I

mentioned on a former occasion. The dose of the Carbonate varies from grs. 5 to ʒi.

Having spoken of the simplest preparations of Iron, I proceed now to what are called the Saline compounds of that article. In these we have an additional property added, viz. an astringent to the tonic operation, and the sphere of their application is, therefore, considerably enlarged. The first that I shall enumerate, is the

*Proto-sulphas Ferri—Sulphate of Iron—Copperas.*—For medicinal purposes, it should be prepared by a direct union of Iron, Sulphuric acid, and water, which are digested for a sufficient length of time, and then evaporated, so that crystals may form.

The green sulphate is prepared for the various purposes of the arts, on a large scale, by exposing the native sulphuret of iron to air and moisture—by the absorption of oxygen the iron is oxydated, the sulphur is converted into sulphuric acid, and by lixiviation the sulphate of iron is extracted. By the preceding process, it is obtained in a purer state, and fitter, therefore, for medicinal uses. This is one of the most active preparations of the metal. Its employment, therefore, requires much more caution than the preceding, for, when given in large doses, it is apt to occasion pains in the stomach and bowels, and may often excite alarming symptoms. Its use should be omitted, and some other preparation employed. It is resorted to in the complaints of the bowels where astringents are required, and was formerly in much repute in the secondary stages of cholera, diarrhœa, &c.

The Sulphate of Iron is not conveniently administered in solution, in consequence of the facility with which it is in that state decomposed. It is commonly given in pills, conjoined with aromatics, or the vegetable bitters.

As a tonic it is also much recommended, and is given variously combined in the several diseases in which iron has been used.

Formula for the Sulphate of Iron:

℞. Ext. Gentian,

Sulphate of Iron, à ʒi.

Oil of Mint, gtt. vj.

Syr. Ginger, q. s. m. ft. Pil. xxxvj. of which 2 are to be taken 3 or 4 times a day.

It also answers well in solution as a wash for indolent and fungous ulcers.

The dose of this article is from one to 5 grs.

The next Salt of Iron is the *Prussias Ferri—Ferro sesquicyanide of Iron*—compound of cyanogen with the sesquioxide and peroxide of Iron. This article agrees with the other preparations of Iron in its general tonic operation, and is introduced in consequence



of its late application to the treatment of Intermittent fever by Dr. Zollickoffer, of Baltimore. Considerable success followed its use in these cases after the bowels had been sufficiently evacuated. It has advantages over the bark in the smallness of the dose, being without taste or smell, and is more prompt in its operation than that article. In children particularly, it may be employed when other medicines would be rejected. This medicine has been used in this city with some advantage, and is highly deserving of a trial.

Dose iv. to vi. grs. every 3 or 4 hours.

The *Tinct. Ferri Muriatis*—*Muriated Tincture of Iron*—or *Tinctura Ferri Sesquichloridi*—is the last of the Saline preparations worthy of your notice. It is prepared by dissolving the carbonate of iron in muriatic or hydrochloric acid, and diluting the solution with alcohol. It is a very active preparation, sometimes too much so to admit of being used in a weak state of the stomach.

Whenever the full operation of iron is desirable, this article is resorted to, and in most cases it will be found to agree very well with the patient. It is a very useful preparation, being much employed in leucorrhœa, amenorrhœa, connected with much feebleness and general relaxation of the system. It commonly goes by the name of Steel-drops, and for its general utility, uniting all the virtues of Iron in so active and agreeable a form, is entitled to a conspicuous station among the preparations of this metal.

As a tonic, the muriated tincture may be taken in doses of from 5 to 20 drops, twice a day, in a wineglassful of water, or in any bitter infusion, those being generally selected which are not blackened by it. The following is a useful form of exhibition.

Tinct. of Muriate of Iron, gtt. vj.

Infus. Quassia, 3vj.

Cinnamon Water, 3vj.

Tinct. Colombo, ʒi.—make a draught.

Repeated several times a day.

The dose may gradually be augmented, if necessary, to 30 drops, but it is apt, in large doses, to produce head-ache, to harden the pulse, and occasion slight spasmodic pains in the stomach and bowels.

Besides its employment in other diseases, in which chalybeates are usually prescribed, it has been recommended in cases of suppression of urine from spasm of the urethra, and in several cases of this nature it has proved very efficacious. It is given in doses of 10 drops every 10 minutes, until relief is obtained, which generally follows after 5 or 6 doses have been given.

The usual dose as a tonic is from 12 to 15 drops in water.

The *Mineral Chalybeate Waters* afford another form under which iron may be administered. The iron is generally dissolved in them by carbonic acid, and from the state of dilution, they are often used with more advantage than the more active preparations of the metal. The most celebrated springs are those of Cheltenham in Gloucestershire, England, and in this country there are several—Bath near Bristol—Yellow Springs, (Va.)—Yellow Spr. near Philadelphia.

Besides the general tonic operation, the waters are much resorted to in scorbutic complaints, in gravel, &c.

I proceed next to the Metallic preparations derived from *Copper*. This metal is not like the greater number of metals, insipid and inodorous, but has an unpleasant, styptic taste, and when rubbed, a perceptible smell. In its pure, metallic state, it exerts but little action on the human system. This fact I noticed on a former occasion, and mentioned upon the authority of Dr. Paris, that copper coins have been swallowed in several instances, and remained in the stomach for some time, without producing any other symptoms than those which were the effect of mechanical obstruction.

It appears, therefore, that Metallic Copper does not undergo any change in the digestive organs, by which it is converted into a poison, and when poisonous effects arise from the use of copper vessels, it is in consequence of a want of cleanliness, by which they become coated with the green carbonate. Copper, however, united with the acids, forms saline compounds of considerable activity, and 1st. of the

*Sulphate of Copper*.—This article is obtained by evaporating waters which hold it in solution. Such waters are found in some copper mines, when the sulphuret of copper, by exposure to air and moisture, has become converted into a sulphate.

Of the emetic operation of this substance, I have already spoken under the proper head, and shall at present only consider its tonic property. It was particularly recommended by Dr. Munro, in the treatment of intermittents, and it appears to have been effectual in the cure of some very obstinate cases. It is used either alone, or as an auxiliary to the bark, in the management of these diseases. It should, however, be given in small doses, as the  $\frac{1}{4}$  or  $\frac{1}{2}$  of a grain, but such is its activity, that even in this quantity it sometimes excites vomiting.

Dr. Munro prescribed this medicine, made into pills, in the year 1785, in some cases of intermittent fever which had resisted the free use of the Peruvian bark, bitters, and other medicines. On first taking the medicine, the patients generally experienced some sickness, but after a day or two this effect ceased.

In employing this article, it is necessary to give it in such doses as the stomach will bear without vomiting, but to allow it to go so far as to occasion some sickness and even nausea. The type of this fever to which it is best adapted, is the quartan, and such is its efficacy that few remedies are considered more deserving of attention. In these cases, it is employed in the following manner.

℞. Sulphate of Copper, gr. iv.

Ext. Cinchona, or Gent., gr. xxxij.—in Pill xvj., one 4 times a day.

From its utility in this affection, its use has been extended to other periodical diseases, as epilepsy, and, by Dr. Cullen, it was spoken of in very favorable terms. Its employment has been supplanted by other remedies which have been mentioned during the course, and it is now but seldom resorted to. To its tonic is also added considerable *astringent properties*, and for this purpose it is much used in some parts of the Union for *arresting hæmorrhages*, particularly from the uterus, whether during pregnancy, or after delivery. For this purpose, it is employed in the state of a weak solution, in the proportion of a grain and half to the ounce, and of this 30 drops are given at a dose in water. This quantity generally produces nausea with a diminution of the hæmorrhage, and the dose is to be repeated in 10 or 15 minutes, if these effects are not felt.

Lately it has been introduced as a remedy in chronic diarrhœa, combined with opium. It has been used in these cases with considerable success, when many remedies had been tried without effect. The dose is generally  $\frac{1}{2}$  a grain twice a day, combined with half a grain of opium, increasing the dose to two or three grains in the day, but seldom beyond that quantity. That the beneficial effects of this practice does not arise from the opium, was proved by its failing to cure these cases when used alone; and the reason of its combination with the copper, was to prevent the latter from causing pain in the stomach and bowels.

Its good effects depend in part upon its astringent operation, and partly in the power the sulphate possesses of allaying irritability of the intestinal canal.—*Med. Chirurgical R.*, No. XXIX., p. 156.

As an external application in syphilitic and obstinate ulcers, it is well known. For this purpose, it is employed in solution, in the proportion of five grains to an ounce of water. When it is used as a caustic application, it is applied in substance. It is also useful as an injection in gleet and in leucorrhœa. In the former disease, gr. i. dissolved in an ounce of water, forms a very excellent injection—the strength of the solution being gradually increased according to circumstances.

The next preparation of Copper, which is preferred by most



practitioners where the active operations of this metal are desired, is the

*Ammoniac Cupro Sulphas—Cuprum Ammoniatum.*—*Ammoniated Copper.*—This combination of Copper was first recommended to medical practitioners by Dr. Cullen, who considered it a milder preparation than the combination of Copper with an acid. It is prepared by triturating together sulphate of copper and carbonate of ammonia in a glass mortar until the effervescence ceases, then enveloping the Ammoniated Copper in bibulous paper, and drying it with a gentle heat. It has a metallic and exceedingly styptic taste, and an ammoniacal odor.

It has been much esteemed in nervous and convulsive diseases, as hysteria, chorea, epilepsy—in the latter of which, it has been spoken of with much confidence by several practitioners. By Dr. Cullen particularly, it was highly extolled, and he states, that in many instances it had effected cures of epilepsy. It is employed in the same manner as the sulphate of copper, beginning with small doses, and increasing them by degrees to what the stomach will bear. It is commonly more manageable than that article, and can be carried to a greater extent without distressing the stomach.

From its strong tonic powers, it can only be advantageously employed when the system has been reduced, and Dr. Ballo, of Genoa, declares that he has hardly ever failed in epilepsy with it, provided it was of the idiopathic species, and the system of the patient a good deal exhausted. Whether it is entitled to these encomiums, my experience will not allow me to say, but I should be inclined to think very favorably of the article, having lately employed it in two cases of epilepsy occurring in young persons, with very striking advantage. In using this article, it is usual to commence with small doses, as  $\frac{1}{2}$  a grain twice a day, gradually increasing the quantity as far as the stomach will bear. It may be given alone, in the form of pills, or combined with valerian. In hysteric affections, attended with great irritability of the system, accompanied with debility, and relaxation, its use has been attended with very beneficial effects, and, judging from its known operation, I should suppose it well adapted to these cases.

In the cure of intermittents, it has been highly spoken of, and by many, said to be equal to arsenic—especially when there is much irritability of the general system, and the intestinal canal in a state of debility. The Ammoniated Copper has also been employed externally for cleansing foul ulcers, and bringing them to discharge laudable pus, and as an escharotic.

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The next of the metals which furnishes tonic preparations is *Zinc*. This is a semi-ductile metal, found in different combinations, in various parts of the world, but usually procured from the ore

called Blende, which is a sulphuret of Zinc. It is of a white colour, with a shade of grey, and it is brittle except at elevated temperatures. It has a peculiar taste, and emits a perceptible smell when rubbed. In its metallic state, it exerts no sensible action on the system, and it is employed under various forms of preparation, which are in general possessed of tonic and astringent powers.

The first of these is the Oxidum Zinci—Oxide or Flowers of Zinc. This article was formerly obtained by the combustion of the metal, which is readily done, as the metal at the temperature of ignition, attracts the oxygen of the atmosphere, and burns with a white and green light, producing an oxide in very light flocculi, which are collected in a crucible inverted over another in which the process is carried on—or the article is prepared in a purer form, by dissolving the sulphate of zinc in distilled water, and adding sufficient aqua ammonia to throw down the whole Oxide of Zinc. The liquor being poured off, the powder is washed frequently with distilled water, and dried in a sand bath—Sulphate of Ammonia and Oxide of Zinc are formed.

The Oxide of Zinc is a medicine which has been much esteemed for its tonic and anti-spasmodic properties. It is, however, somewhat uncertain in its operation, as the presence of acid in the stomach is necessary for the production of its effects. When a state of this organ exists favorable to its action, it excites and invigorates the energies of the system, and has been applied to several forms of disease. These have been chiefly the nervous and spasmodic affections, particularly epilepsy, chorea, hysteria, and others.

In Epilepsy particularly, it has been much used, and was introduced by Dr. Gaubius, in the treatment of the disease. His success was such, that many others were induced to imitate it, and we have the reports of physicians not only in Europe, but in this country, favorable to its employment. Dr. Rush states, that he cured a case of 10 years standing with this medicine.

It may be given alone, or combined with bark, valerian, hyosciamus. You will be not a little surprised when the variety of remedies which have been recommended for this disease are considered. That debility produces spasm, seems to have been long admitted as a medical axiom, and that most of the nervous diseases originate in the same cause, though not acknowledged in words, has at least been so in practice. Hence the variety of tonics which, at different times, have been in use and are still employed. That they are occasionally useful, I will not deny, and that very good effects are often derived from them, cannot be disputed—but I would also trust, that the other pathological views which at different times have been advanced respecting these diseases, will not be overlooked.

Epilepsy in particular, is connected with various states of the

system, being produced by a retention, a suppression, or a diminished flow of the catamenial discharge. It also depends upon the existence of worms in the alimentary canal, and it may be produced by a spiculum of bone, or the presence of other extraneous matter upon the brain. By far the greater number of cases of epilepsy arise from causes which we cannot ascertain, or which, if ascertained, perhaps we do not possess the power to remedy. The treatment the most efficacious, consists in diminishing the volume of fluids by taking blood in small quantities as frequently as circumstances indicate—an occasional purgative, dieting and regularity in the operation of the bowels, and small doses of the Oxide of Zinc.

The flowers of Zinc have also been considered very efficacious in hysteric affections connected with much relaxation and debility. In cases of this kind, it is employed combined with the bark, and in several instances with very considerable advantage.

In Chorea St. Viti this article has been employed, and in one case which occurred in my practice, the success which followed its use was so decided, that I cannot but consider it entitled to a very favorable consideration in this disease.\*

Externally it is applied, in the form of powder, as an absorbent, and mixed with some simple ointment, it proves a mild astringent application to chronic ophthalmia in scrofulous subjects, and to several herpetic, and other cutaneous diseases. The dose for children is from 1 to 3 grains three or four times a day, and for adults from 5 grs. gradually increased to ℥i.—and it appears to be only useful when taken in large doses.

The next preparation of Zinc, is the *Sulphate* or *White Vitriol*. Of this article, I have treated under the head of Emetics, and informed you, that it was one of the speediest and most effectual which we possess, and was, therefore, usually resorted to where the object is to evacuate the stomach when poisons had been taken. It is also a tonic of some value, given in small doses, and has been employed in the same forms of disease in which the oxide is exhibited. It is also employed as a tonic and astringent in chronic dysentery, and lately it has been used advantageously, combined with bitters, as a tonic in dyspepsia. Dr. W. Philip says, that in the opinion of many, the Sulphate of Zinc given in very small doses, holds a distinguished place among the articles suited to indigestion, and it is sometimes successful when other tonics fail. It may be given at later periods than iron, but it requires caution, and if its good effects do not soon appear, should be laid aside.

Its administration in all these cases, requires to be conducted so

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\* At the Bristol Infirmary, Dr. Beddingfield tells us, that out of 40 cases of Chorea that presented themselves, 39 were cured by the Oxide of Zinc, given in doses of 5 grs. 3 times a day, gradually increasing to a scruple.—*Sigmond*.



as to obviate the nausea which it is apt to occasion. In intermittents the White Vitriol has also been employed, and the late Dr. Ffirth was in the habit of prescribing it in this disease combined with a Narcotic, and thought that it might very often be substituted advantageously for the Peruvian bark. In remittent fevers it is a useful and valuable remedy, as we are informed by the same authority; and can be given when the bark is inadmissible, especially if combined with the hyosciamus. Thus combined, it is not so liable to irritate the stomach, and upon a comparison of its virtues with those of bark and arsenic, it will be found, says Dr. F., in many cases to succeed, where those medicines have failed.

It is, I think, deserving of your attention, and though I have never had occasion to employ it, yet it is spoken of in very favorable terms by several respectable physicians.

It is used externally as an injection in gonorrhœa. The following is the usual formula.

℞. Sulphate Zinc, gr. xii.  
Water, ℥viii.  
Tinct. of Opium, ʒi.—m.

A better injection is formed by adding the same quantity of the Acetate of Lead. Formula for a gargle:

℞. Sulphate of Zinc, ʒi.  
Rose Water, ℥viii.  
Honey, ʒi.—m.

Used in ulcerated sore-throat.

The dose of the Sulphate of Zinc as a tonic, is from one to 3 grains, given in the form of pill.

To these preparations may be added the Impure Oxide of Zinc or Tutty, as it is called, and the Lapis Calaminaris, but they are chiefly used as ingredients in making ointments, and other minor purposes. The next of the metals is Silver.

*Nitrate of Silver—Lunar Caustic.*—This salt is formed by the union of nitric acid and the oxide of silver. The mixture is placed upon a sand bath, and upon additional heat being applied, the mass is fused and reduced to a white powder—and it is then poured into moulds, and forms the Lunar Caustic of the shops. Of this article, I have not any remarks very favorable to its internal use. It has been employed chiefly in epilepsy, in dropsies, in angina pectoris, and nervous diseases. In the former disease it has acquired some reputation, and is spoken of in terms of considerable commendation by several physicians. Beginning with small doses, as the eighth of a gr. 3 or 4 times a day, it may be extended to 4 or 6 grs. a day. Under this treatment, the paroxysms at first diminish in violence, and then in frequency, until the patient recovers; and when the bowels are moderately acted upon, the medicine seems in general to act with

more effect. It seems best adapted to those cases which arise from a too great irritability of the nervous system, and to that state of the system which approaches hysteria. The reports of its utility are denied by others, and as I have never employed or heard of its being used with any advantage, I shall be satisfied with having called your attention to this its therapeutical application.

A very disagreeable effect follows its use, which is the discoloration of the rete mucosum, so that the whole surface of the body, and especially those parts most exposed to the light, acquire a leaden grey or livid colour, and which, in some instances, has continued permanently. So uncertain are the beneficial effects derived from its internal use, and so cautious must we necessarily be when recourse is had to it, that I should not have thought it necessary to introduce it into the catalogue of remedies, were it not for the several beneficial purposes to which it is applied as an external application.

The diseases in which it is thus employed, are the Inflammatory affections of the conjunctiva of the eye, or ophthalmia. It has, at various periods, been advantageously employed for the purpose of destroying the granulated surfaces of the conjunctival membrane, the consequence of previous inflammation, and particularly in that species of ophthalmia called the Egyptian. Of late years, we have been told by Mr. Guthrie, that a solution of Lunar Caustic in the proportion of 10 grs. to the ounce of water, and sometimes even much stronger, may be dropped into the eye, not only in ordinary chronic inflammation, after a proper degree of depletion has been practised, but even in the early stages, with the most decided benefit.—That the pain and redness are overcome almost immediately, and the cure effected without the abstraction of blood. Until further experience with the article, I should be unwilling to resort to it in the very early stages of the disease, but after the chronic has succeeded, or depleting remedies have been practised, I can assure you, that the most beneficial effects have been produced by the use of this article, either in the form of solution or ointment.

The ointment is prepared in the following manner.

Nitrate of Silver, grs. ii. to x.

Solution of Acetate of Lead, gtt. xv.

Spermaceti ointment, ʒi. m.

The Nitrate of Silver is first powdered finely, and mixed with the ointment on a slab, the solution being added afterwards. The ointment is grey when first made, but afterwards becomes black. A double decomposition takes place by the addition of the lead, but it is observed, that the Nitrate of Silver is slower in being dissolved by its addition than without. The powdered Nitrate, however, would collect in the fold of the conjunctiva, or rest on

the lid, and cause a slough, which is prevented by adding the lead.

The ointment, from this circumstance, becomes weaker as it grows older, and the stimulating qualities must be judged of by the state of the eye or the strength of the composition.

The manner of using the ointment, is to introduce a portion, from the size of a large pin's head, to that of a pea, between the lids. The eye-lids being closed, are to be gently rubbed with the finger, so as to diffuse the dissolving ointment over the whole surface of the conjunctiva. The application of the ointment causes pain, lasting from half an hour to an hour and a half. On the subsidence of the pain caused by the ointment, that which previously existed is found to be relieved, if not entirely removed, and the patient usually acknowledges the benefit he has received with regard to all the symptoms. The application is to be repeated 2 or 3 days, according to the effects. The principle upon which it operates, is exciting an action greater, and of a different nature from that which existed. I have used the remedy in cases of chronic ophthalmia, and can, with much confidence, recommend it to you. The ointment has also been applied to syphilitic ophthalmia—to weak eyes, to nebulæ, and opacities of the cornea.

Nitrate of Silver is used also in the form of solution, grs. ij. to x. to water ℥i. and applied by means of a camel's hair pencil.

It is recommended in Erysipelas by Dr. Elliottson, and by Dr. Higginbottom of Nottingham.

A line of demarcation is made around the diseased surface, by which the erysipelas is prevented from spreading.

It may also be applied directly to the surface, without any fear of producing mischief.

In circumscribing the Erysipelas, care should be taken, that a circle be drawn all around the portion of the diseased skin—if there be any breach of continuity, it may cause the disease to spread.

Nitrate of Silver has been recommended in Leucorrhœa, and in the form of an injection. Where the system is not plethoric, or the vaginal discharge is not connected with pregnancy, it may be relied upon as a very useful and valuable remedy. Cleanliness should be particularly observed, by frequent washing in tepid water, and afterwards an injection of the Nitrate of Silver in the proportion of

Nitrate of Silver, grs. ij. or iij.

Water, ℥i.

will be found more speedy and effectual than most of the remedies usually resorted to in this troublesome affection.

In using the solution, a bit of sponge firmly tied to a piece of whalebone moistened with this solution. is to be carefully intro-



duced into the vagina up to the os. uteri—a pewter syringe should not be used, as the solution would be decomposed, but one of bone, or glass.

Nitrate of Silver may also be employed in ulcerations of the cervix uteri with great success. In such cases, it is applied by the assistance of the speculum.—*Sigmond*.

Nitrate of Silver is employed in Gonorrhœa. The analogy between this disease and purulent ophthalmia might have led to its employment, for they are both purulent inflammations of mucous membranes. Other salts, as sulphate of zinc, copper, &c. often excite more or less inflammatory action in the urethra, but the Nitrate, instead of exciting more, generally diminishes inflammation, and, on this account, may be employed in the very commencement of the disease. We have used this remedy for the last ten or twelve years, (says the Reviewer of the Russian, Danish, British and American Pharmacopœias—*Foreign Quarterly*, Jan. 1842,) with much more success than any other injection, and have had no reason to believe that it causes hernia humeralis, or any other bad consequence.

The proportions used are 1 to 4 grs. to an ounce of water, the strength being regulated by the greater or less inflammation of the parts.

In Chilblains, it is often very effective. A pretty strong solution is required, from 10 to 30 grs. to an ounce of water—occasionally increased in the proportion of  $\text{ʒi}$ . to the ounce of water, and even more.

In Hæmorrhoids. An ointment composed of from 5 to 10 grs. of Nitrate of Silver, very finely powdered, to an ounce of lard, succeeds in many cases when the hæmorrhoids are recent.

When hæmorrhage arises from internal piles, or from a congestion of the lining membrane of the anus, the solution, in the proportion of from 10 to 30 grs. to an ounce of water, injected with a syringe, is a preferable method.—*Foreign Quarterly*.

Employed also as a very useful application to excoriated nipples, in the form of a weak solution—once or twice a day.

#### The next of the metals is

*Bismuth*.—This metal is of a white colour, with a shade of yellow, has a foliated fracture, is brittle, very fusible, capable of being volatilized, and easily susceptible of oxidation. The only preparation in use, is the Oxide or Subnitrate of Bismuth, as it is called. It has lately been introduced into notice.

It appears that we are indebted to Dr. Odier, of Geneva, for the original introduction of this medicine into the practice of physic. It was recommended as a remedy in spasmodic pain of

the stomach, and bowels, particularly if it arose from organic debility, or a relaxed and emaciated constitution. To Dr. Marcet, of England, and Dr. Moore, of this country, we are indebted for a number of interesting cases in which it was employed, and to their diligence in experimenting with it, we have been made acquainted with the symptoms and condition of the system which it is capable of alleviating. It seems to be particularly well adapted to those dyspeptic cases, where pain follows the introduction of food into the stomach, either in a solid or fluid form, attended with sickness and vomiting. For these symptoms, various tonic medicines have been employed, but without deriving much advantage, and it is here that the Oxide of Bismuth, in doses of 5 grains, combined with 15 grs. of the powdered gum arabic or gum tragacanth, has been found to produce remarkably good effects. When the disease has advanced farther, and we have superadded to these symptoms, flatulency, acid eructations, cardialgia, the Oxide may also be employed, and the beneficial effects derived from it, are not the less remarkable. It is an important medicine in the case of persons habitually subject to cramp of the stomach, and does more to fortify that organ against the returns of the disease, than, perhaps, any of the tonics in common use. The following case proves the influence of this medicine in the disordered states of the stomach.

A boy, aged 14 years, was afflicted with such an excessive degree of irritability of stomach, as to be incapable of retaining any thing upon it a sufficient time for digestion. This continued for upwards of 3 years, and reduced him almost to a skeleton. In this situation, he was ordered a variety of tonics, as quassia, elixir of vitriol, lime water, and rubefacients to the stomach. Every thing which was resorted to, proved ineffectual. He was at last put upon the use of the Bismuth combined with sugar. The day after he commenced taking these powders, the irritability of his stomach was diminished considerably, he could retain food longer than he had done for a year before. The doses of Bismuth were gradually increased, and in three weeks from the commencement of taking the medicine, he was so far recovered, that he could retain light diet without inconvenience, and soon regained perfect health.—*Medical Recorder, Vol. I.*

In that distressing symptom of dyspepsia pyrosis, or water brash, which consists in an eructation of watery fluid, usually of an insipid, but sometimes of an acid nature, this medicine has been of considerable service. It is perfectly safe, and mild in its operation, and therefore may be resorted to without apprehension. To this, I may add, that the evidence in favor of the powers of this remedy in the diseases mentioned, entitles it to much attention from the

profession. The dose of it is from iii. to v. grs. to be combined with mucilage, or any convenient vehicle.

*Aurum—Gold.*—This article was several centuries ago, during the reign of Alchemy, in much repute in medicine, but it fell into disuse. In 1811 it was revived by Dr. Chrestien, of France, who published his observations concerning its remediate powers, and again brought it to the attention of the profession.

It was by him recommended in the various forms of Syphilis, as being a safe and effectual remedy—that it possessed advantages over mercury, inasmuch as the patient was not subjected to the unpleasant effects of pytalism, nor the other inconveniences which often follow the use of that medicine. It was even urged, that during its use, the patient was not subjected to any restraints, either as related to business, or diet, but on the contrary, that generous living promoted the curative operation. The preparations recommended were

1st. Gold in a minute division.—2nd. In the state of an Oxide.

3rd. The Oxides combined with Ammonia and with Tin.

4th. In combination with Muriatic or Hydrochloric Acid.

Of these preparations, the last was much the most active, and it is even asserted to be a more powerful substance than the corrosive sublimate.

The Terchloride of Gold is prepared by evaporating a solution of Gold in nitro-hydrochloric acid to dryness, but as, in this state, it is extremely deliquescent and caustic, it can be but little used. By combining, however, the chloride of sodium with the solution of gold, a product better adapted for medicinal purposes is obtained, and is the article principally employed, forming a Terchloride of Gold and Sodium. The gold, in a minute state of division, may be procured with facility, by pouring into a diluted solution of this metal, a solution of green sulphate of iron—a brown, or bluish brown powder, will be precipitated, which is metallic gold minutely divided. Thus prepared, and with the commendations bestowed upon it by Dr. Chrestien, not only as an anti-syphilitic medicine, but as a remedy well adapted to all diseases of the lymphatic system, it was eagerly sought after, and at one time pretty considerably employed. In Europe, the sanguine expectations formed of it, from the description given, have not been realized, and it appears to have soon fallen into disrepute, and at present I do not know that it is ever employed in the treatment of any diseases. In this country a very fair trial was made with it in the New York Hospital, and though some difference of opinion existed as to its efficacy, yet it maintained a short lived existence, and was spoken of in high terms by Dr. Mitchell, and some other physicians to that establishment. The result of their experiments was, that



it was equal in power to mercury, in curing primary syphilis, and, in some instances, a more rapid cure had taken place than was ever known to be produced by that mineral. Where, however, secondary symptoms have supervened, the gold cannot be depended upon for a radical cure. With this restriction, therefore, of the medicine to the first stages of syphilis, joined to its expensiveness, its use was abandoned, and it appears to have fallen into very general neglect. In its operation, it does not exert any other sensible action upon the system, than that of exciting a free discharge of urine.

The preparations of this metal were administered by Dr. Chretien, by friction, on the gums and inside of the mouth; but if we reason from analogy, more positive effects might be supposed to follow from its being taken internally.

The Terchloride of gold and sodium is, therefore, commonly given in the form of pills, in doses of an eighth of a grain 3 times a day—the Oxide in doses of  $\frac{1}{2}$  grain, increased to 2 grs.; and the Metal, in a state of minute division, to the extent of 3 grs. a day.

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*Arsenicum Album*---*White Arsenic*---*Arsenious Acid*---This mineral is extensively diffused throughout nature, being combined with various metals; and with sulphur—in this latter state forming the ores called Orpiment and Realgar. From these it is extracted by sublimation, in the state of an oxide, the oxidation being effected by the action of the atmospheric air during the volatilization. Though called an oxide, it is not so in reality. It is soluble in water, is capable of crystallizing, of redening litmus paper, and of combining with alkalies, and as, in these respects, it resembles the acids so closely, it is, therefore, denominated Arsenious Acid. United with a higher degree of oxygen, it becomes an acid of higher powers, and is the Arsenic Acid. When pure, the oxide or arsenious acid has a shining, semi-vitreous appearance, of a white colour, and of a corrosive, acrid taste, with some degree of sweetness. This is the preparation used in medicine, and it is prescribed in several forms.

Of the Medical uses of Arsenic. It has long been known in the M. M., and was noticed by the Greek and Arabian physicians. Almost eight hundred years ago, it was prescribed by Avicenna, as an internal medicine, and much was said of its utility. It, however, with difficulty urged its way into practice, being employed chiefly as an external application. It is only in modern times that the medicinal powers of arsenic have been particularly noticed, and its use extended to diseases. The high reputation which this article has maintained, entitles it to the consideration of medical men. From its very great activity, and the prejudices which are entertained against it, it is not as much employed as it deserves. For its febrifuge properties; however, it has long been

celebrated, and so long ago as 1702, it received the warmest and highest commendations. It has been, and continues to be, the basis of *fever nostrums*, and it was from observing the efficacy of a medicine which acquired much reputation as *fever drops*, that Dr. Fowler was led to examine its composition, and from thence to introduce into practice his arsenical solution. It is, however, seldom resorted to until the milder remedies have failed, and thus employed, it has often been very useful in obstinate and protracted cases. It is, therefore, an article very properly enumerated among the remedies for intermittent fever, and will be found deserving of a conspicuous place among them. It is not applicable to all cases of this disease. It is inadmissible in debilitated habits of body, attended with a weak, feeble pulse, and where there is a scorbutic tendency. It would seem, therefore, that its operation is not altogether of a tonic nature, and so strikingly is this the case, that it has by many been doubted whether it is entitled to its present arrangement, since, in its action upon the system, it has none of the properties of this class. During its exhibition, it often produces nausea, lassitude, debility, œdematous swellings of the face and extremities. It has even been alleged that it injures the tone of the stomach, produces vertiginous affections, and paralysis, but the last objections are wholly unfounded. The constitutions to which this medicine is best adapted, are those of an opposite nature to what I have mentioned, and it is chiefly useful where the system is unbroken by the attacks of the disease, neither very irritable or debilitated, the pulse full, soft and regular during the intermission, and no organic disease existing.

Of the administration of Arsenic. In general it may be given to a considerable extent with adults, but we may establish a general rule, says Dr. Potter, which will often prevent those unpleasant consequences which follow the use of large doses. It will be found more advantageous to begin with a small dose, and to increase it until it shall affect the stomach slightly. If the system is much disordered by the solution, it will be proper to discontinue it for a day or two, and instead of 10 drops, the dose for an adult, 3 times a day, 5 drops, six times a day, may be administered, which will often agree with the stomach, and perform a cure as certainly, though not as expeditiously, as a larger dose. It will often be necessary to continue the medicine for some time after the cure is apparently complete—by this practice a relapse may be effectually prevented.

Of the form of administering Arsenic. The most usual form of administering Arsenic, is that of the mineral solution, prepared according to Dr. Fowler's directions. It is made in the following manner. Take of White Arsenic in crystals, and of the purest vegetable alkali, each 64 grs.—of distilled water half a

pound, put them into a Florence flask or other vessel, and submit them to a gentle heat, let them boil moderately until the Arsenic shall be perfectly dissolved, then add to the cold infusion half an ounce of the compound spirits of lavender, and half a pound of distilled water, more or less, so that the solution measures a pound accurately.

The doses for patients, from 2 to 4 years, is 2 drops.

“ “ 5 to 7 “ “ 5 “

“ “ 8 to 12 “ “ 7 “

“ “ 13 to 18 “ “ 10 “

“ “ 18 and upwards, “ 12 “

The hours for taking these drops, when ordered 3 times a day, are 6 o'clock in the morning, two o'clock in the forenoon, and ten at night—and when twice a day, ten in the morning and ten in the evening. These hours are to be adhered to, whether they coincide with the paroxysms of fever or not. In cases of agues, the drops are to be administered in doses proportioned to the age of the patient, for five days, at the end of which, the fits being suspended, the medicine is to be omitted for 2 or 3 days, and repeated for 3 days more, to prevent a relapse. After the paroxysms have been thus suspended, the cure should be completed with the Peruvian bark, which may often accompany the use of the drops. Every practitioner will be aware of the great caution necessary in the exhibition of a remedy, which, though safe in prudent hands, might induce the most dangerous accidents, if exposed to carelessness or ignorance.

In most of the successful cases, the medicine removes the disease without producing any of the inconveniences attending its use in large doses. When the Arsenic begins to shew its poisonous effects, the symptoms are nausea, often accompanied with a slight griping and purging, swellings of the integuments of the body, particularly the face, sometimes uneasiness at the stomach, and a slight eruption like the nettle rash, and in a very few instances head-ache, sweats, and slight tremors. By attending to these serious and very characteristic warnings, and by the assistance of gentle aperients, opiates, and other means which will readily suggest themselves to the prudent physician, this very powerful mineral will be found a very safe article—whilst its cheapness, insipidity and great activity in a very small bulk, will sometimes render it preferable to the safer drugs and barks, which oppress the stomach by the quantity, and disgust by their nauseous flavor.

Arsenic is also exhibited in the form of pill, combined with opium, in the quantity of 1-16 of a gr. of Arsenic and a 1-4 of a gr. of opium, taken 3 times a day.

In Remittent Fevers. This medicine has also been highly spoken of, and as the circumstances of its administration are pretty



similar to what has been directed in the former disease, I need not enter further into particulars.

In Typhus Fever it has been recommended by Dr. Ferriar, and his testimony in its favor is so strong and positive, that though I have never employed, and should not prescribe it, yet so respectable is the authority, that it is worthy of your attention. In the last stages of typhus, he says, when the usual stimulants had no effect in rousing the powers of life, or of lessening the black incrustation which forms on the tongue, the Arsenical solution has uniformly had the effect, of causing the fever to give way, and with it an improved appearance of that organ. The favorable alteration which took place, was too great to admit any doubt respecting its cause, and the number of such events leaves no room for uncertainty. In these cases, Dr. F. thinks, that the remedy does not operate as a general stimulant, but as a sound tonic.

In Periodical Head-aches it has also been employed, and with great advantage—several cases of which disease are recorded as being successfully treated.

Head-aches arise often from such a variety of causes, and in such diversities of constitution, that it would be presuming much to assign for their relief any particular remedy. But periodical head-aches are often connected with the Intermittent form of fever, and require for their removal the same remedies. The mineral solution, therefore, is well adapted to these cases, succeeding often after the bark has failed. They generally appear under a chronic form, are not attended with much of an inflammatory diathesis, and therefore readily yield to the operation of this medicine.

Rheumatism is also another disease in which this article is very useful. It is in these cases, a less ambiguous medicine than the Peruvian bark—though this has also been employed with very good effects. Besides these diseases, Arsenic has been recommended in Hooping-cough—in various spasmodic affections, as chorea, epilepsy, tetanus, asthma, and by many is said to have been useful; but its action is so indeterminate, that I need not enter particularly into its application to them.

In Cutaneous affections, I can speak more confidently of its utility, and have no hesitation in stating that obstinate diseases of the skin are more under the control of this medicine than any other. In the various species of leprosy and ichthyosis, (see Bateman's illustrations,) in herpes, and in the anomalous affections, which are considered under this head, in elephantiasis, it will often be found very beneficial.

In cutaneous affections of a syphilitic origin, where mercury has ceased to exert a beneficial operation, and the usual anti-syphilitic remedies have been equally unsuccessful, Arsenic has been employed with the most propitious results. The constitution seems, in protracted cases, to loose its susceptibility to the action of the

former substances, and though they are persisted in, which is often done by persons not aware of this tendency, a temporary improvement may follow, but the system relapses into its former state, and would ultimately fall a victim to their continued use. Arsenic seems to act in these cases in re-kindling the former susceptibility to impressions, and excites an action which changes the diseased one. Certain am I, that these beneficial effects will follow their alternation with the mineral solution, and, would, with confidence, recommend its employment. In Buboes that after ulceration have refused to heal, and even assumed a malignant aspect, I can say both from my own experience and that of others, that no remedy with which we are acquainted, is so powerful as the internal use of Arsenic. You are all aware of the application of Arsenic to the treatment of Cancers—I do not say cure, for as much as the powers of this article have been extolled in the disease, it is entitled to very little confidence, and I would caution you not to hazard an appeal to it, while the more speedy and effectual mode of treating it by excision, can be practised. Where the disease has advanced so far that we can only alleviate, it has been said to be useful in mitigating the excruciating pains and correcting the fetor of the ulcers. Even for this operation we should feel grateful, and since fate decrees that we shall die, it is no less the duty of the physician to soothe, and soften, the horrors of the approach of death, and let the passage be at least easy and peaceable.

Having completed a consideration of the diseases in which this article exerts a beneficial operation, my description would be incomplete without considering its deleterious action. It is, perhaps, of all natural substances, excepting Prussic acid, that which exerts the most virulent and dreadfully active operation upon the living animal. With the effects we are unfortunately too familiar; its cheapness and abundance render it easily accessible to malevolence, or obnoxious to carelessness, and the history of almost every year, adds to the number of sufferers from this formidable metal.

All the preparations of Arsenic operate in a similar manner, though some with more activity than others, in proportion to their strength. The consequences which follow its introduction into the stomach, in the quantity of a few grains, or upwards, are a most horrible and indescribable anxiety at the pit of the stomach, to which succeeds a very acute burning pain in this organ, generally attended with violent retching and vomiting, whereby the life of the sufferer is sometimes preserved, owing to the rejection of the Arsenic. This is often followed with some purging, and the pain proceeds with increased violence to the bowels, and almost the whole of the alimentary canal. To this succeeds, in a shorter or longer time, convulsive tremors of the limbs and cold sweats. If relief is not obtained from these symptoms, they

quickly proceed to the destruction of the patient; his pains become so much augmented that insensibility succeeds, coldness and stiffness of the limbs take place, the eyes are bloodshot and glassy, he becomes unable to swallow, death at last terminates his agony. Examination after death, exhibits the stomach and intestines in a highly inflamed state, the inflammation being confined to the mucous membrane, which becomes soft and pulpy, and easily detached; the blood vessels on its surface are frequently turgid, and sometimes there are small spots of extravasated blood. Such are the effects of a large dose taken into the stomach—the consequences of its external application are no less severe and destructive.

From some experiments of Mr. Brodie, it appears, that when applied externally to a wound, death has been produced, and that the appearances to be observed on the internal membrane of the stomach and intestines are nearly the same.

Certain peculiarities attend the operation of this poison, which it may be useful to notice. Persons who have recovered from a large dose, seldom regain their previous health and strength, but become sallow, emaciated, and enfeebled. Obstructions in the liver are apt to ensue, attacks of jaundice frequently occur, and the teeth which were before remarkable for their whiteness, become incrustated with a black scale, and some of them decay without pain. Digestion is often weak, and food, after remaining a few hours on the stomach, is not unfrequently returned crude and undigested.

Of the treatment to be pursued, when a large dose of Arsenic has been swallowed. This will consist in evacuating the stomach and intestines as speedily as possible. For this purpose, emetics, either from the vegetable or mineral kingdom, may be employed; the former have been preferred as effecting the desired object without producing any additional irritation.

Oil particularly has been recommended with the view of diminishing its acrimony, and hastening its passage through the bowels. To this is added various mucilaginous matters—milk, limewater, &c. Large draughts of milk should be given both before and after vomiting. It acts by its coagulation, in enveloping the poison, and thereby promoting its discharge.

But our hopes of relief cannot rest upon them. Of the antidotes which have been recommended, as sulphur, the hepar sulphuris, or sulphuret of potash, very little dependence is to be placed. For, however they may unite with, and render this article inert out of the body, they have no such operation when administered with this view. Others have been proposed, as magnesia by Mr. Hume, and charcoal by M. Bertrand. Three cases are given of alleged recoveries from the use of large doses of magnesia—other circumstances probably contributed to the recovery.



Bertrand, confident in the power of charcoal, took five grs. of arsenic in a charcoal emulsion, and suffered no inconvenience but a sensation of warmth in the epigastrium, and considerable thirst, though he did not vomit. Whatever may be the power of this substance when mingled with the poison before its ingestion, Orfila has proved, by numerous experiments, that it has no effect in preventing the action of the poison after it has been swallowed.

The Hydrated Sesquioxide of Iron, has been lately recommended as an antidote to Arsenic. The value of this preparation as a preventive of the effects of Arsenic on the living body, has been tested in a favorable manner by several persons.

Without detaining you with the accounts of experiments on animals, I shall proceed to an interesting case related by M. Geoffroy:

A hair-dresser, in a fit of delirium tremens, took from his desk a paper which contained white arsenic, amounting to at least a drachm and a half. In twenty minutes afterwards, the hydrated tritoxide of iron was obtained, and four or five pints of warm or cold water charged with it, were given in a quarter of an hour. The treatment was continued for the next seven or eight hours, so that altogether the patient took twenty or twenty-five pounds of water in which was suspended six ounces and four drams of the preparation of Iron. The first administration of the antidote was followed by copious vomiting, and a stool—and during the remaining period, the patient was vomited and purged three times. There was neither colic, nor heat in the throat, nor any symptom of poisoning. He complained of cramps in the fingers, and during the whole time was delirious, talking and gesticulating. He slept during the night ensuing the treatment, and in the morning appeared well.

The Sesquioxide of Iron should be kept as a hydrate, for the dried powder does not act as an antidote. The chemical change consists in the conversion of the arsenious acid into an arsenite of iron. Three times the quantity of the preparation of iron is sufficient to neutralize arsenious acid in solution, and the decomposition is instantaneous, but as the arsenic when used as a poison is almost always swallowed in powder, a much larger proportion of the antidote is advisable, for the action goes on slowly.

Arsenic has been known to produce a poisonous operation upon the system, applied externally to wounds and ulcers, and as a wash to the skin. Several cases are related of these effects being produced, by applying an ointment containing arsenic to the head, or using a wash of arsenic for the cure of itch. In the latter case the body swelled prodigiously, and was covered with an erysipelatous eruption. The person dragged out a painful existence for two years, but during life was always afflicted with a trembling

of the limbs. From many well supported cases, these effects have been so clearly traced to the injudicious application of the arsenical preparations to the surface, either as an application to ulcers and wounds, or to the skin generally, that its use in this manner should be interdicted, except in the hands of regular practitioners. There can be no doubt, that the various quack preparations used both in England and France, and in this country, for the cure of cancer, and which have arsenic for their base, have, in most cases, proved destructive to the patients.

To illustrate its effects more fully, I shall state the following case, from Sir A. Cooper's lectures. A patient was brought into Guy's Hospital with a fungus of the eye, and was placed under the care of one of the surgeons of that institution. The surgeon ordered a solution of arsenic to be applied to the part. After it had been used three days, the man complained of pain in the stomach, but this was not supposed to arise from the use of the solution. The application was continued—the pain in the stomach became excessive, convulsive tremors of the muscles succeeded, and the patient died. Upon examination of the body after death, the stomach was found in the highest degree inflamed, and exhibiting the peculiar appearance which is produced by arsenic. The person died, therefore, from the use of the arsenical solution.

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Before concluding the subject of Tonics, it will be proper to consider a few substances, which, though not strictly belonging to the Mineral kingdom, may be associated with the preceding, as they are connected with them by chemical relations. These substances are the Mineral acids, and they are often convenient as well as agreeable modes of administering Tonics.

The first that I shall speak of, is the

*Sulphuric Acid.*—It is the acid called Oil of Vitriol in commerce. It is possessed of astringent as well as tonic properties, and is employed pretty extensively in diseases. Given sufficiently diluted, it is very useful in restoring tone to the digestive organs, and strengthening the appetite. It also tends to check fermentation in weak stomachs, and hence, though itself an acid, it counteracts morbid acidity in the first passages. I alluded, in a former instance, to this property in the Mineral acids, and noticed it as distinguishing them, in their operation, from the Vegetable. They resist the digestive process, and while they correct the acetous fermentation, they also improve the tone of the bowels. In hæmorrhages, it is considered a valuable medicine, and in debilitating discharges of every kind. In hæmotypsis, it often answers an important purpose as a secondary remedy, after the more active means of depletion and vesication, or where the strength is too far exhausted to admit of the use of the lancet.

It is also used in similar circumstances in Menorrhagia, and is employed with very good effect in checking the colliquative sweats in hectic fever. In the latter discharge, its effects are so peculiar and marked, that its place is not supplied by any other article in the M. M.

Externally it has been recommended in various cutaneous and eruptive diseases, particularly in that disagreeable complaint, scabies or itch, as a substitute for the sulphur ointment. It is usually incorporated with lard, in the proportion of thirty drops of the acid to an ounce of lard—the strength of which may be increased; or as a wash, in the state of a very dilute solution. It is usually administered internally, in the form of the diluted sulphuric acid, the dose of which is 10 to 15 drops, with water sufficient to be pleasantly acid—or in the state of elixir of vitriol—which is the acid in a state of dilution, with an aromatic added, the dose of which is 10 to 15 drops.

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*Nitric Acid.*—This acid is the product of the saturation of nitrogen with oxygen. It is obtained by decomposing nitrate of potash by sulphuric acid, assisted by heat. The sulphuric acid combines with the potash, and the acid of the nitre distils over in the state of nitrous acid—this exposed to a gentle heat, loses the portion of nitrous acid gas loosely dissolved in it, and is converted into nitric acid.

This article, though not very long introduced into the M. M., is one of very considerable utility, and is employed in several forms of disease. As a tonic, it has been employed in several cases of general debility, and from it much advantage has been derived. Given largely diluted with water, and rendered agreeable to the patient, by the addition of saccharine substances, it may be taken freely, and will be found a pleasant medicine. In the state of the constitution connected with hepatic derangements, and the distressing train of nervous symptoms which so often proceed from this cause, the nitric acid may be used with great benefit in the place of bark or other tonics. It is, I may say, in cases of chronic obstructions of the liver, which so frequently occur in warm climates, and as a consequence of bilious fevers—a state of the liver which gives rise to a variety of anomalous symptoms, that this medicine will be found particularly useful. To its tonic, is united an alterative operation upon the secretions of that organ, which, though allied to mercury, is indeed in some cases infinitely superior.

Its powers are conspicuous in curing some of the symptoms of secondary syphilis. Most of us may have had occasion to observe, that in this disease, mercury not unfrequently ceases to produce any salutary effects, and that it even aggravates the



patient's sufferings, by the peculiar symptoms which it produces. Such occurrences are not unusual, and the specific operation of mercury is not exercised, either from the long continuance of its use, or from the system being too much debilitated. It is true that the good effects of nitric acid are manifested, and it will be found effectual in lessening the pains of the limbs, in causing the ulcers to heal, the blotches to become less vivid, and finally to fade, and to improve the general vigor of the system.

It is, however, incapable of permanently curing the disease, and other preparations are often necessary. In the primary stages in which it was extolled when first introduced into practice, it is now, from more extensive experience, conceded to be inadmissible, and is seldom resorted to in this stage, but to support the system under the irritation of a mercurial course.

Externally it is applied as a wash to syphilitic ulcers, and in certain chronic eruptions. It is an excellent application for checking gangrene of a part, and producing a slight stimulus. When used in such cases, it is largely diluted with water in the proportion of 50 drops to a quart of water. The acid may be increased to a drachm, according as it creates pain or not, but generally the usual quantity is 50 drops. Sir A. Cooper has seen, in a short time after its application, a quick separation of the parts, and healthy granulations spring up. Besides this advantage, the application serves to correct the offensive smell of the ulcer.

The usual mode of exhibiting the acid, is in the proportion of one or two drachms to a quart of water, sweetened with syrup. This may be taken daily.

Nitric acid united with the hydrochloric, forming the Nitro Hydrochloric acid, has lately been applied to the surface of the body, in the state of a bath, largely diluted with water. It has been proposed as a substitute for the internal use of mercury, or the acid preparations, where these substances were inconvenient to be taken, or produced distressing symptoms. It may be employed whenever the mercurial preparations are indicated, with this difference, that in cases where they are injurious from delicacy, or peculiarity of constitution, or from other causes, the Nitro Hydrochloric acid bath may be employed with safety and advantage. It seems to affect, in a peculiar manner, the glands, and to alter their secretions, and upon this operation, a great part of its value, in derangements of the liver, depends. It is particularly in Chronic hepatitis, and in functional derangements of this organ, that its good effects are exhibited, and in the opinion of Dr. Scott, by whom its use was introduced, it is the most effectual and the safest remedy. The bath is directed to be prepared in the following manner. Equal parts of the Nitric and Muriatic acids are poured in a bottle containing a quantity of water at least equal in bulk to both the acids.

The acids are added separately, and each well mixed with the water to prevent the escape of a very pungent gas, (the chlorine,) which would take place, but for this precaution. Of the strength of the bath, it is not easy to give particular directions, but it is commonly made as strong as very weak vinegar. As a general rule, an ounce of the Nitro Hydrochloric solution, will be sufficient for a gallon of water, which may be increased or diminished, according to the irritability of the patient's skin. When the bath is employed, the patient is kept immersed in it half an hour every day, and this is continued until a sensation of uneasiness is produced in the mouth, which usually takes place in eight or ten days, when its use is to be omitted. In general the skin becomes so much irritated, that the further action of the bath cannot be supported. At the expiration of this period, it will be found, Dr. Scott observes, to have produced a constitutional impression—the appetite to be improved, digestion to be performed with less uneasiness, and the functions of the liver restored to a more healthy state. These effects were not only experienced in his own person, but in a number of cases in which he directed it. When the bath cannot be employed, the same beneficial effects are derived from immersing the feet and legs in a tub containing a mixture of the same strength. For economy and effect, the tub should be deep, and no larger than necessary. The bath, I should have observed, ought to be tepid, and after it is used, may be employed a second or third time, and we may save the expenditure of acid, by warming a portion of the bath in a porcelain vessel near the fire. The feet and legs are kept in the bath half an hour, but with delicate persons, not more than half, or a third of that time, can be borne. It is even said, that sponging the skin with Nitro Muriatic acid diluted with water, gives rise to the same effects with bathing, and is more easily applied. Fifteen or 20 minutes may be employed in the sponging, though a much less time has been found to produce the same effects. I do not think this is as safe and agreeable as bathing.

Such is the practice which was recommended by Dr. Scott, as a substitute for the mercurial preparations in the chronic affections of the liver. It has met with an able advocate in Dr. James Johnson, who speaks of it in very high terms.

The practice has been repeated in this city, and in several instances beneficial results have been obtained. From the experience I have had with it in two instances, I should unhesitatingly recommend it to your attention as a very useful auxiliary remedy. It will be found best adapted to those cases which have already been under the mercurial influence, but in which mercury disagrees, or where the prejudices of the patient are so violent, that it cannot be urged to the extent of producing all its beneficial effects.

The bath is also very useful in paralytic affections of the limbs,

as the irritation which it excites upon the skin, will be found to relieve the distressing sense of coldness and numbness which are so much complained of, and to infuse warmth and some little animation in the enfeebled member. For greater precision, I annex the formula of Dr. J. Johnson. Into a glass vessel capable of containing a pint of fluid, put eight ounces of water, and then pour in four ounces of nitric and 4 oz. of muriatic or hydrochloric acids. An ounce of this mixture to a gallon of warm water, will form a bath of medium strength, and as is commonly employed. The proportion may be increased to an ounce and a half, or diminished half an ounce of the solution, to the gallon of water, according to the age, strength, delicacy, or other peculiarity of the patient.

The *Muriatic* or *Hydrochloric acid* is another which has been employed medicinally. In general it may be applied to the same diseases in which the nitric acid has been recommended; but there are others in which it is more particularly applicable, and these I shall briefly describe. Diluted very freely with water, it is employed as a gargle in ulcerated sore-throat, and diluted to a much greater degree in erosive ulcerations of the gums. It is very commonly used to diminish the acidity of the stomach by checking the process of the acetous fermentation, and give energy to that organ.

Of all the acids, it is the most useful as a Lithontriptic, and when upon that subject, I entered fully into the details of its application. At present, I shall only remind you, that it is to be employed when there is too great a tendency to alkalescence in the system, or when the deposits are of that character.

Besides these properties, it is well known, that it is Antiseptic in a considerable degree. Sir Wm. Fordyce relates, that a dry salter acquired a large fortune from possessing a secret that had enabled him to send our provisions to India in a better state of preservation than any other of the trade. This secret consisted in adding a small quantity of muriatic acid to the contents of each cask.

Muriatic acid gas is in most repute for purifying and cleansing foul wards and chambers. For this purpose, it is prepared extemporaneously by pouring sulphuric acid gradually on a mixture of common salt, two parts of the former, to one of the latter. As the vapor is corrosive and suffocating, it cannot be tolerated in large quantities, and must, therefore, be disengaged slowly and with caution in rooms which are inhabited.

In concluding this subject, I may observe of all the Acid preparations, that as they exercise a considerable action upon the teeth, they should, when their use is required for any length of time, be taken into the back of the mouth through a quill, or tube, and the mouth rinsed immediately after. They should also, when administered, be so much diluted as never to taste stronger than lemonade,



for when of a greater strength, pain and uneasiness are produced in the stomach, and their use is discontinued prematurely.

*Chlorides of Lime and Soda.*—The late introduction of these articles into use, and the very important purposes to which they are subservient as disinfecting and therapeutical agents, renders it proper that some notice be taken of them, and though somewhat out of place, yet they may well follow the consideration of the muriatic acid, which has been so much commended and used for purifying foul wards and chambers.

The Chloride of Lime is formed by the union of chlorine with the oxide of calcium. It is obtained by introducing a current of chlorine gas into an air tight vessel or chamber containing some slacked lime, and continuing the operation until the lime ceases to absorb the chlorine.

The period when this substance was discovered, is not accurately known. It is thought to have been first made by Mackintosh in the year 1798. It was afterwards prepared by Tennant, who obtained a patent for its preparation, and for its application to bleaching. This article, however, has lately acquired additional importance from the labors of Mr. Labarraque, a Parisian pharmacist, who has demonstrated its usefulness as a disinfecting agent. It was first applied by him as a disinfecting agent, in the manufacture of cat-gut, with such success, as to receive the premium offered by the Society of Encouragement of Paris, for such a valuable discovery.

It was afterwards applied to other purposes, as to disinfecting dead bodies in amphi-theatres and dissecting rooms, decomposing miasmata of every kind, preventing the generation of epidemic diseases, or arresting their progress when they exist. Also for destroying the infectious smell arising from privies, sewers, chamber buckets, putrid waters, &c.—for disinfecting hospitals, prisons, putrid meat, vegetables, and all such purposes.

The manner in which this agent acts, is easily explained. The chlorine of the alkaline chlorides is gradually given off to the atmosphere, which combines with the hydrogen, one of the products of decomposed matter, and forms Muriatic acid, while the carbonic acid, another of the products, combines with the lime, and thus the effluvium is decomposed.

In Therapeutics, the Chloride of Lime has been employed as a wash in sordid and offensive ulcers, in wounds complicated with hospital gangrene, to large and superficial burns when the inflammation has subsided. It has also been applied to scurvy, scald head, itch, and other affections of the skin—in chilblains—as a wash in ulcers of the uterus, cancers, &c.

Thus employed, it not only corrects the offensive odor from

diseased surfaces, but it proves a wholesome and useful stimulus. Combined, in the form of a solution, with linseed oil, it is a very useful application to ulcers produced by burns.

In cases of retained Placenta, where it becomes putrid, with a very disagreeable odor, and distressing constitutional symptoms, injections composed of the Chloride of Lime, in the proportion of ʒi. to a pint of water, have been thrown up the vagina with considerable advantage.

The Chloride of Lime being a cheap article, is preferred for common purposes, requiring the use of the article in any considerable quantity. For surgical purposes, the Chloride of Soda is preferred.

It is prepared by passing a stream of chlorine gas through a dilute solution of the carbonate of soda in a Wolfe's apparatus.

It is employed usefully in all those chronic affections of the skin for which stimulating lotions are usually recommended, and for the several other purposes for which the preceding article has been used, particularly in scabies or itch—herpes, lepra—psoriasis. Used diluted, and at times undiluted.

In addition, it has been employed in erythematous inflammation, and in ulcerations of the throat as a gargle.

Dr. Darling has found this article useful in controlling the inflammation of the mouth produced by mercury. It has, in his hands, arrested the salivation, when diligently applied at the commencement; and in the worst cases, when the flow of saliva was great, the ulceration extensive and the pain severe, it has given comparative ease in a few hours, checked the inflammatory action, and enabled the patient to take rest. He concludes, that with this preparation in hand, salivation is no longer a dread to him, and, consequently, he can prescribe mercury with much less apprehension than formerly, wherever the free use of the remedy is desirable. The article has been employed in our public institutions, and in private practice, and the conclusions drawn were favorable to its use, but by no means entitled it to the encomiums bestowed upon it.

#### ASTRINGENTS.

By the term Astringent, is meant, substances which obviate or remove increased evacuations, by their power of constringing or condensing the simple solids of which the vessels are formed. By the operation of this corrugating power, either directly exerted on a part, or extended by sympathetic action, the morbid affections arising from a state of relaxation are supposed to be removed. Mechanical as is this explanation, and applicable as it is, in part, in accounting for some of the phenomena which result from their

action, it must be received with some limitation. For, though we admit such a corrugating power exercised by some substances in dead animal matter, we cannot allow them the same condensing powers while that matter is under the control of the vital principles. For this reason many have denied the existence of such remedies, and have considered those articles which have received the appellation of astringents, merely as stimulants, moderate and permanent in their action, in other words, as tonics inferior in their effects to the preceding. Although such an operation is exercised by these medicines, as we know from the influence of some of them in removing intermittent fevers, yet they also restrain excessive discharges, and constringing as they do the tongue, the same action may be extended along the alimentary canal, and diminish its undue secretions. But how this same action should be extended to other and distant parts, and that very often in a short space of time, is what is difficult to explain, and in this instance, as in others, we must acknowledge our inability to determine the essential character of the impressions produced by remedies upon the living system.

From the great difficulty of accounting for the extension of the astringent operation to distant parts of the body, some physicians have doubted whether the internal employment of such medicines can be of any service in stopping hæmorrhages, except those of the *primæ viæ*. The well known operation which many of the articles of this class possess, of arresting hæmorrhages, very soon after they have been taken into the stomach, and before they can be supposed to have entered the circulation, would induce us to abide by the old and common opinion of their use. Since it is not very difficult to suppose that their action may be communicated, by means of the nervous system, from the stomach to the remotest parts of the body.\* Many instances of internal bleedings that have ceased on the exhibition of astringents, would incline me to look upon this explanation of their action as just.

But though the nature of their action must still be obscure, the character of the diseases to which astringents are applied, is well understood. They are employed to diminish excessive discharges from the body, either of blood, serum or mucus, and for these several purposes are often very useful. Upon this subject I shall speak more fully when considering the individual articles. The astringent principle is diffused very extensively throughout the vegetable kingdom, and is connected with the presence of tannin. Of the Vegetable astringents, the most important are the different species of *Querci* or Oaks.

*Family Cupuliferæ—Quercus Robur—Common Oak.*—This species of oak, which is made officinal, is a native of Britain, where

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\* They may also be absorbed, and thus modify the properties of the blood.



it grows to a considerable size. There are many American species of Oak, which are also possessed of a considerable degree of astringency. Of these the Red Oak is the most esteemed for this property. The bark of the branches is probably more astringent than that of the trunk, on account of the mass of dead cortical layers, which constitutes a part of the thickness of the latter. Oak bark manifests to the taste a strong astringency, accompanied with a moderate bitterness, qualities which are extracted both by water and by rectified spirit. Its universal use and preference in the tanning of leather, is a proof of its great astringency. The astringent operation of the oak was known to the ancients, by whom different parts of the tree were used. Galen recommended a decoction of the leaves and outer bark in dysentery, uterine and pulmonary discharges, and in other affections. It is undoubtedly a very useful article, and may often be resorted to very advantageously.

In Intermittent fevers it has been employed, in the form of powder, given to the extent of half a drachm every 2 or 3 hours during the intermissions of the fever, and both by itself, and joined with other articles, has prevented the returns of the paroxysms.—*Cullen.*

But it is a very unpleasant medicine, and few patients can take it without some disgust, unless rendered more agreeable by being united with aromatics. It is more advantageously employed in chronic diarrhœa. Administered according to the following formula.

Infusion of Oak\* bark,   ℥iiss.

Powdered Galls,           g. x.

Tinct. Catechu,           3ss.

Tinct. Cardamom† Comp. 3ss.

Syrup of Orange peel,   3ss. m. for a draught—to be repeated as often as is necessary.

The decoction of Oak bark is also very useful as an injection in leucorrhœa, combined with alum as a gargle in slight tumefactions of the mucous membrane of the fauces, in prolapsus uvulæ, an unpleasant affection to which many persons are subjected upon slight exposures to cold, and as a wash in prolapsus ani.

In more general use, and a more powerful article, is the *Gallæ* or *Galls*, an excrescence of the Oak. In the warm climate of the East, they are found upon the leaves or branches of this tree, and are occasioned by a small insect which deposits an egg in the

\* The Infusion of Bark is prepared by pouring ℥viii. of boiling water upon ℥ss. of bruised bark, macerating for an hour and strain.

† Cardamom seeds are procured from a plant, a native of India. They come to us enclosed in trilobular capsules, which they occupy in three rows. They have a penetrating and highly aromatic smell and taste, which resides wholly in a volatile oil. Medicinally they are warm stimulants and diaphoretics, and are used to communicate a pungent and agreeable quality to various compound medicines.

substance of the leaf or branch, by making a perforation through the under surface. The ball presently begins to grow, and the egg in the centre changes to a worm, which finally eats its passage out, leaving a round hole. There are two species of Galls to be met with in the shops, one of which is brought from Aleppo, and the other from the southern parts of Europe. The former are the best. They are also to be found on the oaks in the U. S., and are not without some activity. Medicinally considered, they are applicable to the same diseases as the bark of the Oak, and by possessing a greater degree of astringency, seem to have advantages over the bark, and to be better suited for external use. Reduced to a fine powder, and made into an ointment, in the following proportions— $2\frac{1}{2}$  parts of finely powdered galls, and a small portion of opium, with 3 parts of Goulard's cerate, it forms a very valuable application to hæmorrhoidal tumors.

An infusion or decoction of galls is also used as an injection in piles, gonorrhœa, or more properly gleets, in leucorrhœa, &c.

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The next article is

*Family Leguminosæ—Kino.*—Our knowledge of this substance has, for some time, been very imperfect. By some, it has been considered a gum. and, by others, a resin. It is generally admitted, at present, that it is neither; but a vegetable extract, obtained by inspissating the decoctions of the leaves and twigs of certain trees. The substance called Kino, is obtained from several trees: the *Coccoloba uvifera* of America, furnishes a species; the *Eucalyptus resinifera* of New Holland, another; another from the *Acacias*, growing upon the river Gambia in Africa. The true Kino comes from the East Indies, and is furnished by a tree named *Nauclea Gambir*. The tree grows to a considerable height; and it is from the leaves and twigs, boiled in water, and reduced to an extract, that the substance is prepared.

It is a hard, brittle gum, of a deep red, or almost black color. It has no smell, but applied to the tongue, it soon discovers a strong but grateful astringency, with a slight degree of subsequent sweetness. It is very soluble both in water and alcohol. The solutions are coloured and transparent, and strike an intensely black colour with sulphate of iron.

This article was introduced into the *M. M.* by Dr. Fothergill, and by him recommended in the treatment of obstinate Intermittents. In some of these cases he succeeded beyond his hopes, and, in others, it disappointed his expectations. He directed it to be given in doses of  $\text{ʒss.}$  of the tincture, an hour before the paroxysm, and every 4 hours during the intermission. Under this treatment the paroxysms became milder, and soon disappeared. It is not, however, a remedy in which much confidence is placed at present, and I believe, is rarely, if ever, resorted to in these affections. In none

of the cases mentioned by Dr. F., was the Intermittent immediately stopt. In many of them, it continued for the space of several weeks, and during that period, it is at least probable, that the cure may have taken place from some other cause, or may have terminated spontaneously.

In various preternatural discharges, it seems to be a remedy better adapted, and, in these cases, has been tried with different success. In profuse discharges of the catamenia, it has sometimes afforded great relief. But it is principally in affections of the bowels, in dysentery and diarrhœa, that it is found advantageous. Its use should not be resorted to, until the bowels have been well cleansed, and their acrid and unwholesome contents removed. Before this is done, astringents would, undoubtedly, be very mischievous. For, though the number of the discharges are lessened by this practice, and the patient flatters himself that his recovery is speedy, yet the disease will recur upon the medicine being discontinued, and will thus continue to return, and to be checked, until the patience of the sick person is exhausted.

First, in nearly all cases evacuate the bowels, either with an emetico cathartic, or a cathartic alone, and if but little fever exists, have recourse to astringents, which act, not only in restraining the excessive discharges, but in giving tone to the bowels. As co-operating with their action, diaphoretics should be combined with them. Upon this principle, Dr. Fordyce proceeded, when he prescribed a combination of Tormentil and Ipecacuana. The combination which I prefer, is the following.

℞. Solut. Gum Arabic,  $\frac{3}{4}$ iv.  
 Tinct. Kino,  $\frac{3}{4}$ ss.  
 Wine Antimon.,  $\frac{3}{4}$ iii.  
 Tinct. Opii,  $\frac{3}{4}$ i.—m.  $\frac{3}{4}$ ss. q. t. h.

Thus employed, it is a pleasant mixture, and a very useful one. Kino, in my opinion, is, of the vegetable astringents, the most active, and the most generally resorted to. It is a common addition to the cretaceous mixture.

In chronic dysenteries, the same practice is to be pursued. In incontinence of urine occurring in boys or young children, remarkable benefit has been obtained from its daily use. Besides these diseases, it has been recommended as an injection in leucorrhœa, gleet, &c., and in other cases, where astringents are required. In gleet, Mr. Bell recommends very highly the following formula.

Gum Kino,  $\frac{3}{4}$ i.  
 Alum,  $\frac{3}{4}$ i.  
 Mucilage of Gum Arabic,  $\frac{3}{4}$ i.  
 Water,  $\frac{3}{4}$ bi.

Let them be well united together, and filter for use.

Kino and Columbo combined, forms, Dr. Chapman states, a



certain and powerful purgative; but this is an anomaly in medicinal combinations, and has not been verified upon experiment. The dose of the tincture is a drachm, and of the powder, from v. to x. grs.

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*Hæmatoxylon Campechianum*—*Logwood*.—This tree is a native of South America, and grows to the highest perfection at Campeachy, in the Bay of Honduras. The wood is of a solid texture, and of a dark red colour. It is imported into this country principally for the use of dyers, cut intounks or logs, and of these pieces the largest and thickest are preferred as being of the deepest colour. It has a sweetish, sub-astringent taste, and no remarkable smell, gives a purplish red tincture both to watery and spirituous infusions, and tinges the stools, and sometimes the urine, of the same colour. From experiments conducted with this view, it does not appear to colour the bones of animals, as observed of madder, and some other plants of that class. It is used medicinally as an astringent in several disordered states of the intestinal canal, particularly in diarrhœa, and, for its efficacy in this respect, it has the recommendation of some of the first medical authorities. I have on several occasions employed it with much advantage in chronic cases which have resisted the more ordinary modes of treatment, and have found the complaint very essentially checked by its use. It is given in the form of a strong infusion or decoction, alone or combined with the mucilage of gum arabic. In the advanced stages of cholera infantum, it is also had recourse to, when the passages are thin, frequent and watery, the strength of the child much reduced, and the intestinal canal and its vessels relaxed and debilitated. It is a remedy which may be more generally employed, and I learn that it is a favorite article with some of our practitioners, and they have frequently succeeded with it, when other substances have been tried without any benefit. It is not unpleasant to the taste, and when sweetened with a little sugar, children will generally take it pretty freely. It is given in the form of infusion or decoction; the first is preferred for young patients, and the latter for adults. The dose is from half an ounce, to a small teacupful several times a day.

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Of the *Catechu* or *Terra Japonica*, which is included in all systems upon the M. M., I need not employ your time with its consideration. It is so nearly allied to Kino in its properties that, that article may be substituted for it on all occasions. I shall proceed, therefore, to our Native astringents, and among them will be found several useful and even valuable plants, and, first, of the

*Family Geraniaceæ*—*Geranium Maculatum*—*Spotted Geranium*

or *Cranesbill*.—It is also called Crow's-foot in some parts of the Union, though improperly. This plant grows very generally throughout the United States, being found in low grounds and upon the banks of rivers. The root, which is the part used in medicine, is internally of a green colour, and when dried, is exceedingly brittle and easily reduced to powder. It is said to be one of the most active astringents we possess, and from its decided properties, as well as the ease of procuring it, it may well supersede in medicine many foreign articles of this class which are consumed among us. The diseases in which it is recommended, are those in which astringents are indicated, as the advanced stages of diarrhœa and dysentery, cholera infantum, &c.

In these cases, it is very conveniently given in the form of decoction, united with milk, and many instances might be adduced from practitioners residing in the country, of its good effects. It has been used in other cases where this class of remedies is employed, as an injection in gonorrhœa, in the formation of gargles, and as a wash for chronic and obstinate ulcers of the mouth. It is given in powder in doses of 20 grains, in tincture, and in decoction boiled with milk.

As a proof of the considerable astringent powers which this article possesses, I may observe, that upon a comparison of its active ingredients, tannin and gallic acid, with kino, the precipitates formed with the Geranium, were always most abundant and immediate.—*A. Med. Botany.*

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*Family Rosaceæ*---*Rubus Villosus* et *R. Procumbens*---*Tall or High Blackberry* and the *Low Blackberry*.---These plants are so nearly allied to each other, that they do not require a separate consideration. Under the term *Rubus*, is comprehended, a large family of shrubs, including the various species of Raspberry, Blackberry, Dewberry, &c. They are too well known to require any particular description. The root is the part which is medicinally employed. It is a *pure and strong astringent*, which property it manifests both by its sensible effects, and by chemical examination. It is, therefore, employed in the same diseases for which the preceding article has been recommended. In some parts of the Union it is a very popular remedy, and exhibits most valuable powers in cholera infantum, after the tormina and griping have been relieved. Preceded by proper evacuations, few articles agree better, and from which more pleasant effects will be derived. I can speak with some confidence of its utility, having employed it in these cases to check the frequent and very copious discharges from the bowels, which often occur at the conclusion of the disease. It is in such cases that it is to be resorted to, and it often succeeds after other articles have been unavailingly employed. It is given in the form

of a strong decoction, in doses of a half wineglass, to a glassful, and may be sweetened with sugar or united with milk.

In diarrhœas of old people, it is equally useful, employed in the secondary stages, after the removal of offending causes from the alimentary canal—and it is probably susceptible of a much more extensive application to diseases.

The decoction is prepared in the following manner:— $\zeta$ ss. or  $\zeta$ i. of the bruised root is boiled in a pint of water, until it becomes of the colour of claret. The dose is from a tablespoonful to a wineglassful.

The list of our indigenous astringents might be extended, and a variety of others added, whose virtues have been in high repute, but I have mentioned the most valuable, and such as are capable of fulfilling all the operations which are expected from this class, and will proceed to the consideration of those derived from the Mineral kingdom.

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*Sulphate of Alumina and Potash—Alum.*—This salt is composed chiefly of Alumina with Sulphuric acid, the latter being in excess. It likewise contains a portion of potash, which is essential even to its constitution.

It is found native, efflorescing generally in the interstices of Alum Slate—or it is prepared from Alum Ores. It is in large masses, transparent, colourless and vitreous in appearance, having a styptic taste, with a degree of sweetness.

Of the Medicinal uses of Alum. Its virtues appear to have been long known, though chiefly as an external application, and it is principally to modern physicians, that we are indebted for its successful employment to diseases internally administered. It has been much commended by Dr. Lind in the treatment of Intermittent fevers, combined with nutmeg, and this, he declares, proved more successful in his practice than the Peruvian bark. Such may have been the case, but it is not a remedy upon which I should rely. Being a very unpleasant medicine in large doses, it will often disagree with the stomach, and I should not, therefore, venture upon its use, when other more agreeable and certain articles could be obtained. In the complaints of the bowels, it is better adapted, and as it is to its astringent operation that beneficial effects are derived, chiefly in long continued discharges from them.

In protracted dysentery, and in the advanced stages of cholera infantum, it is found beneficial, and in these cases it is combined with Gum Arabic and prepared Chalk or sugar, to which a little opium may be added, according to circumstances. In colica pictorum and obstinate colics, it has been said to be one of the most effectual remedies we possess.



Richter speaks in high terms of its effects in these painful and very distressing complaints. Fifteen grs. of the powdered Alum are to be given every 2 or 3 hours by itself, or in combination with opium. Given in this quantity every 4, 5 or 6 hours, it has been found to prove gently aperient, and when the symptoms were not severe, the second or third dose seldom failed to mitigate the pain, and sometimes entirely removed it.

It is principally in hæmorrhages that it is employed, whether from the lungs or uterus. In cases of hæmoptysis, it is not so well adapted, as the discharge from this organ is always connected with some excitement of the system, when depleting remedies, a cooling regimen, &c. will be found much more advantageous. But in menorrhagia, and other uterine hæmorrhages, which often depend upon a laxity of the vessels of the uterus, it may, and has often, been of service. In discharges from this organ, it was first employed by Van Helmont, who acquired considerable reputation from his success. It should be given at first in small doses, as it is liable to irritate the stomach, and in some instances excites vomiting. In urgent cases, however, the doses must be frequently repeated and increased, for it is only from large quantities given, that its effects have appeared to be considerable. It may be given in powder in doses of 5 grains, which may be increased to 20, or in the form of Alum whey, which is most agreeable to the stomach. Alum whey being a preparation somewhat popular, is prepared in the following manner.

**R. Boiling Milk, 1 pt.**

**Powd. Alum, ℥ii.**

Boil them until the coagulum separates, and strain. The dose is a cupful taken occasionally.

Highly, therefore, as it has been extolled in uterine hæmorrhages, it is, in my opinion, much inferior to some other articles, and so well convinced am I of this fact, that I have rarely employed it, preferring the sac. satur. or small doses of ipecac. In hæmorrhages, connected with great laxity of the uterine vessels, it may be used advantageously, and in these cases will afford much satisfaction. In other profuse discharges it is resorted to—as leucorrhœa, gleet, &c., and in these cases, applied locally in the form of injection, it is capable of doing considerable good. I have employed it advantageously in this manner, combined with a strong decoction of the red oak bark.

Externally, Alum is applied to a variety of purposes, and is resorted to very frequently. As an ingredient in the formation of gargles for cleansing ulcers of the mouth and fauces, or in relaxation of the uvula, it is well known. As an injection in gleet, it is much employed, by adding a small quantity to a decoction of galls.

In ophthalmia, a useful application is made by rubbing Alum in

the white of an egg—a coagulum is formed, which makes a cooling and pleasant poultice for the eye. It should be spread on a fold of linen, and applied over the eye. This is a very popular remedy, and where much pain and inflammation exist, from its coolness and softness, will, in conjunction with other remedies, be found very serviceable. It should be frequently renewed, as the warmth of the skin dissipates its moisture, and soon forms a dry crust, which becomes then very uncomfortable.

Alum deprived of its water of crystallization, commonly called Burnt Alum, forms a good escharotic, and is employed in removing luxuriant granulations. The same substance mixed with butter or honey, is a useful application to apthous ulcers, and I have often found it superior to borax.

The utility of Alum in powder, has been lately announced by Velpeau, in acute cynanche tonsillaris. He states, that this powder, applied by means of the finger to the fauces and inflamed parts, exercises a wonderful effect. The symptoms, he observes, are stopped as by enchantment, the fever diminishes, the redness and tumefaction of the inflamed parts subside, the appetite returns, and convalescence is speedily established. This application is successful at any period before suppuration has been established.

Before Velpeau, no practitioner ever dreamed of making use of Alum as a local application during the first stage of acute cynanche tonsillaris.

Alum has long been applied, in substance, to the throat, in cases of angina maligna, and in chronic sore-throat.

Of the modes of exhibiting this article. These are, in powder, combined with opium, as follows.

℞. Powdered Alum, ʒss.

Gum Opium, gr. iii.—mix and divide into vi. powders, one every 2 or 3 hours.

Or, the Alum whey, prepared by pouring a pint of boiling milk on ʒii. of Powdered Alum, and removing the coagulum which is formed. The dose is a wineglassful, repeated as often as the circumstances of the case require.

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*Of Lead and its preparations.*—Lead is found in a great variety of minerals, combined with sulphur, oxygen, and various acids. It is usually procured from the common Sulphuret of Lead, or Galena, by exposing that mineral to a strong heat, till the sulphur is driven off, and the lead reduced to fusion. In its metallic state, it exerts but little action upon the system, but is rendered active, by being combined with various acids, forming saline compounds. The only preparation in which we are interested at present, is the Super Acetate of Lead, commonly called Saccharum Saturni. It is prepared by boiling distilled vinegar upon cerusse, or the white

oxide of lead, until it acquires a sweet taste. The liquor is then evaporated, which, on cooling, affords crystals of a slender, prismatic form. This article may, with propriety, be considered as among the most important of the M. M.

Objections have at different times been made to its use, from the deleterious operation of the oxides of lead upon the human system. To such an extent had the dread of the operation of these substances been carried, that this article was by many considered unsafe, and at one time was almost proscribed—the writings of Sir Geo. Baker, and Dr. Heberden, having had considerable influence in causing the article to be viewed in an unfavorable light. This latter writer states, that he hardly ever saw a case in which the probable good to be expected from the Sac. Saturni as a styptic, would counterbalance the many certain mischiefs arising from its internal use.”

The opinions of these gentlemen circulating extensively, caused considerable apprehensions respecting its employment, and they continued to operate, until the judgment and penetration of Dr. Reynolds, discovered that these effects may be obviated by combination with opium. The correctness of this statement has been repeatedly confirmed in subsequent trials with it, and the opinion at present entertained is, that though deleterious effects may arise from its injudicious use, yet, under ordinary circumstances, it is perfectly safe, and, I may add, innocent.

The diseases in which it has been employed, have been various, and much has been said, at different times, of its utility in intermittents, dropsies, and in several spasmodic diseases; but its efficacy in these cases is so equivocal, and we are in possession of other remedies so much better adapted to their removal, that I need not enter into the details of its application to them, but shall confine my description to those diseases only, in which its reputation is acknowledged, and, first, of its utility in

Hæmorrhages. In these cases, it exhibits powers which may almost be considered specific, and which, when abstractly considered, are truly wonderful. For, how so small a portion of substance, with scarcely any sensible properties, can, when taken into the system, effect such unexpected changes upon parts often distant, and that very frequently, in a very short space of time, is among the many mysterious operations which our limited views of life, and the action of agents upon it, will not enable us to explain. But though such is its action in many cases, it is not so invariably, and it is now admitted, that, to ensure its good effects, certain preparatory measures are necessary. Hæmorrhages from the lungs are almost always accompanied with considerable arterial excitement, and this, I need hardly repeat, must be reduced, before any benefit will be derived from the preparation of lead.



When the excitement has been diminished, by V. S. or other depleting remedies, and the expectoration continues bloody, or streaked with blood, the Sac. Satur. will be found productive of good effects, given in doses of 2 grs. every 2 or 3 hours, with a few drops of laudanum.

But it is principally in hæmorrhages from the uterus, that it appears best adapted. Even here, its use requires limitation, and our practice, in these cases, must be regulated with judgment, and a degree of decision which can only be the result of a perfect acquaintance with our subject. In those profuse discharges of blood which precede delivery, or immediately succeed it, depending upon a separation of some portion of the placenta, other means must be resorted to, for producing contraction of the uterus, as this only can restrain and close up the patulous mouths of the vessels. The Acetate of Lead is only adapted to those moderate hæmorrhages which occur in the unimpregnated uterus, or when pregnancy is not far advanced—and here, in combination with opium, in the proportion of 2 grs. of the Acetate and  $\frac{1}{2}$  gr. of opium, it will be frequently found useful. Employed at a proper period, it exerts a decided operation upon the arterial system, and, I may add, that I have never known it produce any unpleasant effects upon the bowels. The dose must be repeated as often as the urgency of the case requires. Dr. Barton states, that in alarming hæmorrhages, he has given to the extent of two or 3 grs. twice or thrice a day. I may safely say, that I have given 20 times that quantity, without any bad effects being produced, and, in urgent cases, would not hesitate to employ it, and recommend to you the same practice. Much is due to the late Dr. Barton, for the zeal with which he advocated the utility of this article, and his exertions to dispel the prejudices against its employment which existed in a great degree at the time when he wrote. Repeated trials with it, in this, and other diseases, have satisfied me, that it is a more safe article than was supposed.

It is employed in hæmorrhages from other organs—from the bladder, the bowels, &c. combined with opium in the manner I have mentioned.

Besides these diseases, the Sac. Satur. has been recommended in several others, and with such good effect, that I may enter a little into details. In various irritable affections of the stomach, it was employed by one of the most distinguished physicians of our city, the late Dr. Irvine, and with effects often very satisfactory. In that irritable state of this organ, connected with yellow fever, and other febrile affections, it had his warmest approbation, and such has been his success in allaying its convulsive and irregular actions, that he was almost disposed to invest it with specific powers, certainly to give it a precedence over all other remedies. It is usually combined

with the powdered liquorice root, which renders it more pleasant to the taste.\*

In the complaints of the Alimentary canal, in dysentery and diarrhoea, it is useful, after the more usual remedies have been employed. In the former disease particularly, I have employed it with great advantage, and have found more benefit from it in checking the frequent discharges, the tenesmus, the mucous and bloody dejections which are so tormenting and alarming to the patient. In this disease, I have not relied solely upon its powers, but have combined with it small portions of ipecac. and opium, and can state, that more relief has been obtained from their union, than could have been expected or conceived. The formula I have employed is the following.

R. Acetate of Lead, gr. xii.

Powd. Ipecac., gr. vi.

Gum Opium, gr. iv.

Syrup, q. s. m. and divide into viii. pills, one every two hours until relief is afforded.

This formula I rarely employ until the bowels have been evacuated, and the general excitement of the system reduced, and when the dysenteric symptoms resist the usual remedies—I then resort to this preparation, and generally with the happiest effects.

Besides these diseases, the preparations of Lead have lately been employed in hydrophobia, and as the only case recorded of recovery from this dreadful disease, has been under their use, I need make no apology for its introduction. The case was that of a man, who, in endeavoring to separate two dogs that were fighting, was bitten in the thick part of the thumb. The wound bled considerably, became much inflamed, with some pain of the whole arm. These symptoms subsided, and after a few days the wound granulated, and gradually healed. Two months and a half afterwards, on the 12th August, symptoms of hydrophobia came on. His wife, on pouring out a cup of tea, perceived his countenance undergo considerable change; he pushed his chair violently back, started up instantly, and clung to the mantle-piece for breath, and displayed a degree of horror at the sight of the fluid on the table, wholly indescribable. His wife, alarmed at this extraordinary change in his usual habits, called in the assistance of her neighbors. He still continued to cling to the mantle-piece, his feet resting on the fender. He implored, with much earnestness, of the people around him, to remove the breakfast things as speedily as possible. This being done, he requested to be led into the air. On approaching the door, he complained of a violent sickness, ejected from his stomach a small quantity of bilious

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\* Further experience in the use of this article in this disease, has not confirmed these opinions.

coloured matter. This effect instantly brought on a fresh spasm, accompanied with an extreme sense of suffocation. These symptoms were all characteristic of the complaint, and it was accordingly looked upon as one of great danger.

The part bit which had healed, was excised, and caustic potash applied to produce a slough in the first instance, and afterwards a purulent discharge. Thirty ounces of blood were taken from the arm, and a scruple of musk was prescribed in a small quantity of jelly. Although the patient continued tolerably quiet and easy under this treatment, and occasionally slumbered, yet there was an evident increase of nervous excitement. As evening approached, he complained of intolerable thirst, and difficulty of swallowing his saliva. At six in the evening, he was persuaded, with much difficulty, to take a little weak wine and water through the spout of a tea-pot, so as to exclude from his sight the liquid to be drunk.

The naming of the subject of fluid instantly produced a most violent convulsion, pain was experienced at the pit of the stomach, and the patient expressed a wish that he might be confined, as he felt a disposition to inflict injury on himself or on others. In this situation, Dr. Fayerman, a physician of Norwich, England, conceived the idea of giving a preparation of Lead, from the known property of these preparations to act upon the nervous system, and to calm undue excitement. At nine o'clock, p. m., of the day the patient had been taken sick, 35 drops of the liquor Plumb. Superacetatis, commonly called Goulard's Extract, was given on a lump of sugar. The pulse at this period was tremulous, irregular and 105. The power of deglutition at this period was greatly impeded by the frequent spasms affecting the glottis, and it was at least 15 minutes before the medicated sugar passed into the stomach. At ten o'clock, the dose was increased, and he took 40 drops of the extract of Lead in the same manner as before—pulse 98. He slept from  $\frac{1}{2}$  past ten, to within a few minutes of eleven. He was awoke by some pain about the scrobiculus cordis, great thirst and heat about the fauces, but there was an absence of spasmodic constriction, which had previously threatened suffocation. At one o'clock, on the 13th of August, the venæ sect. was repeated, and 45 drops of the extract of Lead was given mixed in a small portion of honey. At 3, the dose was repeated, and, notwithstanding the powerful astringency of the medicine, there was less difficulty in swallowing. The pain about the stomach had been reduced in violence since the use of the lancet a second time, and the mind had become more clear and collected. At 5 o'clock, the thirst having increased beyond what could be supported, he expressed a desire to drink. A little weak brandy and water, mixed in a tea-pot, was presented to him, but



the moment the fluid had been taken to the lips, a violent spasm came on. He seized the vessel with the fury of a maniac, and bit the spout off. In 25 minutes after this paroxysm had subsided, 50 drops of the solution of Lead was administered. At nine o'clock, he complained of a coldness along the spine, and of a peculiar, tingling sensation in the lower extremities, and, soon afterwards, of a total inability to move the limbs; the pulse at this time was 84. The legs were examined and found to be paralytic. The symptoms of hydrophobia became, every hour after this crisis, materially lessened. At half past ten, 3 tablespoonsful of castor oil were administered, and the dose of the solution of Lead was reduced to 20 drops every 3 hours. At 12 o'clock, the bowels were evacuated. At 2 o'clock, an attempt was again made to swallow a little brandy and water. The patient made a bold and resolute effort to conquer or die in the struggle. He armed his mind with the strongest courage and fortitude. He carried the vessel to his lips, and although his countenance fully displayed the most horrid repugnance, yet, from the total absence of spasm, he succeeded in getting down a considerable portion of the fluid. From this moment, Dr. Fayerman considered the cause as gained, and hailed with joy, the triumph which such a conquest inspired. The dose was gradually diminished to 10 drops, and the Dr. had the satisfaction to find that, in the space of 48 hours from the first exhibition of the solution of Lead, in this case of hydrophobia, all the more urgent symptoms of this dreadful disease had abated. In four days, not the least appearance of hydrophobic malady existed. The patient had the look of a person enervated and debilitated to an excessive degree. The wound in the hand was suffered to remain open for some weeks. On the 26th September, the patient recovered the use of his limbs, and was discharged.

The above case has been detailed at some length, and is highly interesting. It is, I believe, the only recorded instance of recovery from this complaint, and should further trials prove successful, it will be a triumph of the healing art, and wipe out one of the opprobria medicorum. The case has been extracted from the *Lancet*, a work written in a sarcastic style, but with much ability.

It has also been employed in Tetanus, administered in the same manner, and in one instance, with good effects, the patient recovering.

Of the Poisonous operation of Lead. The mineral poisons of which I have spoken, have been termed Corrosive poisons; the article of which I am now speaking, has been considered an Astringent poison. The term is not correct, since, in addition to this peculiar symptom, there is also inflammation of the texture of the digestive canal. There are a variety of ways in which poisoning by Lead takes place. They are with the Acetate of Lead—the Red Oxide of Lead—the Carbonate of Lead—Wines

sweetened with Lead—Water impregnated with Lead—Food cooked in Leaden utensils—Syrups and Spirits clarified with Acetate of Lead—Saturnine Emanations. The poisonous effects of Lead are produced chiefly from the Carbonate, and where poisonous symptoms arise from the Acetate, it is in consequence of its being converted into the Carbonate. Dr. A. T. Thompson explains this in a very satisfactory manner. He shews, that the solution of the Acetate of Lead, when exposed to the air, attracts a quantity of Carbonic acid, and is thus converted into a Carbonate. If you expose a solution of the Acetate of Lead to the full influence of the air, the Carbonate will be gradually deposited in the shape of a white powder. In this manner, solutions of Acetate of Lead, added to fermenting poultices, may be converted into a Carbonate, and thus produce poisonous symptoms, while the Acetate of Lead may be given internally and continued a long time without any of these effects. Dr. T. has known ʒvj. taken internally, without producing any bad effect. In all cases, he thinks, that any injurious effects may be obviated, by adding an additional quantity of vinegar to the Acetate.

Poisoning from Lead takes place also from the volatilization of the metal. Thus, the house painter will tell you, that the painting of "dead white," or the statuary white, is most likely to produce a deleterious effect. In doing this, they use the white lead combined with a large proportion of oil of turpentine, and in order to produce the intended effect, they are in the habit of excluding the air as much as possible. By means of the temperature of a close room, the turpentine is volatilized, and with it the lead, and in this state, appears to have an extraordinary power of impregnating the system. Some of the worst cases of colic are produced in this manner. Painting in the open air, even when the same preparation is employed, is comparatively harmless.—*Sigmond.*

The symptoms produced by the gradual introduction of Lead into the system, are the following. Colic is among the earliest symptoms, and, from this circumstance, the complaint has been styled, for a length of time, Colica Pictonum. It is not acute at first, nor of long duration, but frequently returns, and at last becomes intolerably severe. The mouth is dry, there is generally an absence of fever—sickness of the stomach is present, and sometimes vomiting, which will last for several days. The abdomen is drawn inwards towards the navel, and this sinking, is the more observable, as the pain becomes more intense. Costiveness is very common, and the alvine evacuations are discharged with pain and difficulty. Paralysis of the fingers, hands and wrists is also a frequent accompaniment of this disease, and it occurs most severely in those who are in the constant practice of handling preparations of Lead.

The treatment which this disease requires, with the proper



means to be pursued in obviating it, and preventing its recurrence, falling properly under the department of the practical professor, I shall not enter into its consideration. I will only observe, that where any of the salts of Lead have been swallowed accidentally, in a large quantity, they may be so neutralized as to become inert.

From the experiments of Orfila, it appears, that the Sulphates of Soda and Magnesia are the most useful remedies against the noxious effects of the Salts of Lead. They decompose the Acetate in particular, and transform it into an insoluble Sulphate of Lead, which is innocuous. The other saturnine preparations are equally decomposed, and transformed into insoluble Sulphates by the addition of sulphate of magnesia, or any other soluble sulphate. In case, then, of the ingestion of a drink containing a soluble Salt of Lead, the first duty of a physician is, to cause the patient to take copious draughts of water, containing 3 or 4 drachms of sulphate of magnesia, soda or potash, to each pint.

Where poisoning arises from Saturnine emanations, as is the case with those who are engaged in the use of Lead—as painters, potters, glaziers, workers in glass, gilders, miners, &c. the disease of colica pictonum is produced, the treatment of which, would be out of my province to consider.

Externally applied, Lead is useful in a variety of local diseases. In Ophthalmia, it forms the basis of most of the Collyria employed in this affection, and is, without doubt, a very excellent article, where the inflammation is unconnected with constitutional causes. It is used in the proportion of a grain to the ounce of water, and I have commonly found the addition of laudanum to contribute very essentially in relieving irritation and pain, co-operating therefore with the reputed operation of the Lead.

The same combination, but in increased quantity, as  $1\frac{1}{2}$  gr. to the oz. of water, is equally good as an injection in Gonorrhœa, when this mode of treatment is adopted.

Injections being only temporary applications, it becomes necessary to use them often, especially in cases where they are found to be of service. They should, therefore, be applied as often as is convenient, perhaps every 3 or 4 hours. But this must be regulated by the effects of the injection, for, if it prove irritating, it will not be proper to use it so often, as it may be productive of bad consequences.

Astringent injections, I would wish to observe, if used, should be towards the *close* of the disease, when it has become mild, Should the disease begin mildly, they may be used at the very commencement, for by gradually lessening the discharge, without increasing the inflammation, the cure is completed, and the continuation of the discharge, called gleet, is prevented. It is still further to be observed, that if injections of this kind are



made too strong, they have an irritating quality, which, in some measure, destroys their astringency, and, instead of lessening, makes them increase the discharge. In this way, they sometimes do a great deal of harm, causing the inflammation to spread, and thereby inducing swellings of the testicles, suppressions of urine, and abscesses in the perineum. For these reasons, a good deal of caution is required in their use, and it will often be proper to employ a smaller proportion of the Salt than is set down in the prescription. Thus, in very irritable subjects, half a scruple of the Super. Acetate of Lead, to  $\text{zviij}$ . of distilled water, will be found sufficient. If injections are employed—a practice I do not recommend—the above directions in their use, should be kept in view.

As an application to Phlegmonous tumours, you are all aware, in how much repute, is the Saturnine lotion. One or two drachms of the Acetate are dissolved in a pint of water, and the usual directions for employing it, are, to fold a piece of soft rag several times—wet it with the solution, and apply it to the inflamed part; or, bread is broken up fine, thoroughly wetted with the solution, and employed as a cold poultice. Such are the principal purposes for which the Sac. Satur. is resorted to.

There is another form of using the Lead, which is not so much in repute at present—the *Goulard's Extract*. It is prepared by boiling vinegar, on litharge, for an hour, stirring it all the while. After the whole has stood to settle, pour off the liquor which is upon the top, into bottles, for use. This is the original preparation of Goulard, a French surgeon, who introduced it many years since into practice, under the name of Extract of Saturnine, and was recommended by him, in a variety of diseases, internally exhibited as well as externally applied. In the former, combined with an equal quantity of the tinct. of digitalis, it is employed in hæmoptysis and other hæmorrhages, and externally, to bruises, burns, inflammations, sprains, &c., but it possesses no advantages over the salt I have spoken of, and as it is more variable in its strength, is, on that account, an inferior preparation.

With this extract is also formed an ointment, called Goulard's cerate, and as it is a cooling and pleasant application, it is still much employed.

To these articles might be added the Sulphate of Zinc; but having, on several occasions, spoken of its properties, a repetition would be superfluous.